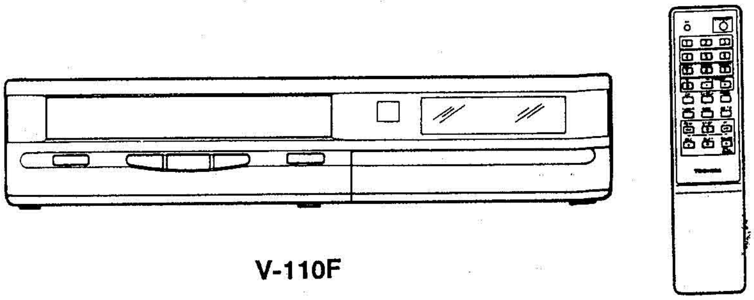
SERVICE DATA
FILE NO. 780 - 018

TOSHIBA

COLOR VIDEO CASSETTE RECORDER

V-110F/120F/130F/170F/180F



V-110F

SPECIFICATIONS

GENERAL

Video recording system:	Head configuration 2-head rotary
Video signal:	CCIR standard, SECAM color (V-110F/120F/130F) CCIR standard, PAL/SECAM color (V-170F/180F)
Storage temperature:	-20° to +60°C (-4° to +140°F)
Operating temperature:	5° to 40°C (41° to 104°F)
Antenna:	75-ohms external aerial terminal for UHF

Channel coverage:

	VHF	UHF	CATV
PAL (V-170F/180F)	E2 - E12	E21 - E69	———
SECAM	EB - FC F1 - F6	E21 - E69 E21 - E69	C - Q 71 - 86

a total of up to 39 preselected channels

AERIAL output signal:	UHF channel 32 - 40 (variable)
Power requirement:	AC 220V, 50Hz
Power consumption:	30W
Weight:	6.0kg
Dimensions:	398(W) X 85(H) X 337(D) mm

VIDEO

Input:	VIDEO LINE IN: AV socket, 1.0V (p-p), 75-ohms unbalanced, sync negative

VIDEO

Output:	VIDEO LINE OUT: AV socket, 1.0V (p-p), 75-ohms unbalanced, sync negative
Signal-to-noise ratio:	Better than 43 dB

AUDIO

Input:	AUDIO LINE IN: AV socket, – 3.8 dBm
Output:	AUDIO LINE OUT: AV socket, – 3.8 dBm
Frequency response:	80 to 10 kHz
Signal-to-noise ratio:	Better than 42 dB

TAPE TRANSPORT

Tape speed:	23.39 mm/sec.
Maximum recording-time:	4 hours (with E-240)
Fast forward time:	Within 6 min. (E-180)
Rewind time:	Within 6 min. (E-180)

TIMER

Range:	1 year
Clock:	24 hour display, quartz control
No. of events:	8 over 1 year

Caution: Copyright Act 1956 Users of video recording equipment should note that it may be unlawful to record television broadcasts, cinematograph films or video recording without the permission of the relevant copyright owner.

Design and specifications are subject to change without notice.

PRENTED IN JAPAN, Dec., 1990 Ⓢ

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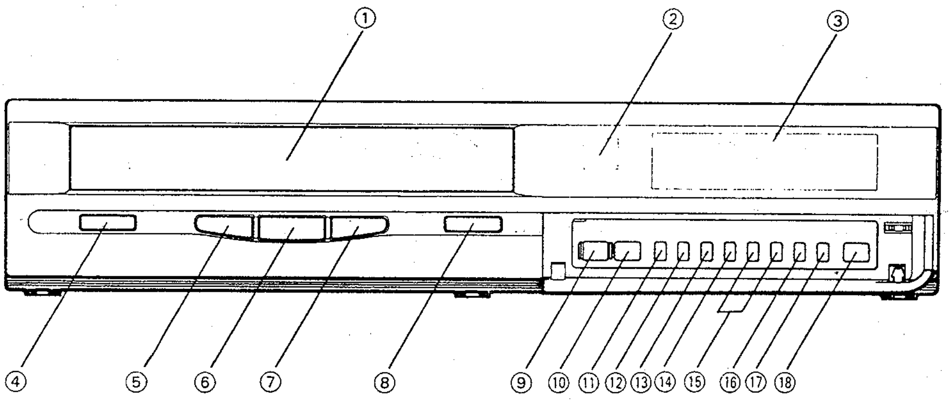
SECTION 1
GENERAL DESCRIPTION

OPERATING INSTRUCTIONS

DESCRIPTION ABREGEE (PANNEAU AVANT)



① **Logement à cassette**
Destiné aux cassettes VHS.

② **Capteur de télécommande**

③ **Affichage**

④ **Touche d'éjection (EJECT. ⏏)**
Pour éjecter la cassette du magnétoscope.

⑤ **Touche de rebobinage rapide (RET.RAP ⊖, ◀◀)**
Pour rebobiner la bande en mode d'arrêt ou pour lancer la recherche en arrière au cours de la lecture.

⑥ **Touche de lecture (LECTURE ▶)**
Pour lancer la lecture ou l'enregistrement.

⑦ **Touche d'avance rapide (AV.RAP ⊖, ▶▶)**
Pour faire avancer rapidement la bande en mode d'arrêt ou pour lancer la recherche en avant au cours de la lecture.

⑧ **Touche d'arrêt (ARRET ■)**
Pour arrêter le défilement de la bande.

⑨ **Touche d'enregistrement (ENR. ●)**
Pour entrer en mode de pause à l'enregistrement ou pour lancer l'enregistrement immédiat.
Pour lancer l'enregistrement, appuyer sur la touche ENR., puis sur la lecture LECTURE.

⑩ **Touche d'arrêt momentané/de gel d'image (PAUSE/AR.IMAGE ❚❚)**
Pour arrêter momentanément la bande pendant la lecture ou l'enregistrement et pour geler l'image ou faire défiler les images une par une.

⑪ **Touche d'affichage (AFFICH.)**
Pour choisir l'affichage du compteur ou de l'horloge, pour choisir le type de cassette installée, ou la durée de bande restante, en mode de compteur.

⑫ **Touche de réinitialisation (0000)**
Pour réinitialiser le compteur à 0000 ou pour accorder le téléviseur sur le canal de sortie du magnétoscope.

⑬ **Touche d'alignement/de stabilisation verticale (ALIGN./V-STAB.)**
Pour régler l'alignement ou pour pour régler la stabilité de l'image à l'aide des touches +/−.

⑭ **Touche d'accord fin (FIN)**
Pour accorder de manière précise le canal de télévision à l'aide des touches +/−.

⑮ **Touches +/- de programme télévisé (PROG. TV +/-)**
Pour choisir les canaux de télévision, ou pour ajuster l'alignement, la stabilité de l'image, ou pour accorder de manière précise le téléviseur après avoir enclenché la touche ALIGN./V-STAB. ou FIN.

⑯ **Touche audio-vidéo (A.V.)**
- Pour choisir l'entrée AV (prise TELEVISEUR) sur le magnétoscope.
- Pour prérégler les programmes de CANAL PLUS.

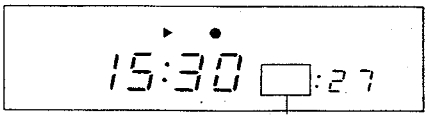
⑰ **Touche de norme (NORMES)**
Pour choisir les canaux de télévision VHF/UHF (FB - FC, F1 à F6 et E21 à E69) ou les canaux de télédistribution (C à Q et 71 à 86) lors du préréglage de canal.

⑱ **Touche automatique (AUTO ⊙)**
Pour commuter la minuterie sur marche/arrêt.

Sélection du mode vidéo

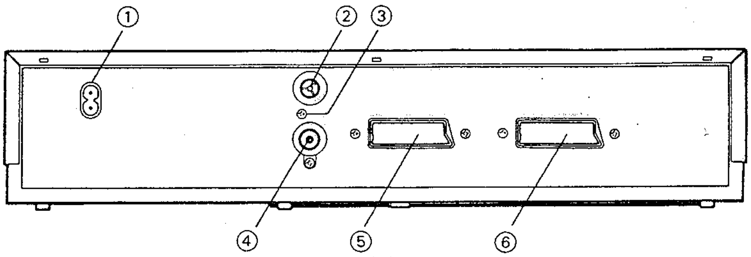
Quand le signal vidéo est un signal couleur
Appuyer sur la touche NORMES pendant 3 secondes environ, de façon que "Pr" apparaisse sur l'affichage.

Quand le signal vidéo est un signal monochrome
Appuyer sur la touche NORMES pendant 3 secondes environ, de façon que "Pc" apparaisse sur l'affichage.



Remarques
- L'indication "Pr" ou "Pc" apparaît sur l'affichage, en mode d'arrêt, quand une cassette est installée, ou en mode d'horloge, pendant l'enregistrement.
- Pendant la lecture ou le mode de compteur, la sélection du mode vidéo s'effectue sans que l'indication "Pr" ou "Pc" n'apparaisse sur l'affichage.

DESCRIPTION ABREGEE (PANNEAU ARRIERE)



① **Prise d'entrée de courant alternatif (ENTREE SECTEUR)**
Y brancher le cordon d'alimentation fourni.

② **Prise de sortie d'antenne (SORTIE ANTENNE)**
Y brancher la prise d'antenne du téléviseur.

③ **Réglage de canal UHF (CANAL)**
Choisir un canal UHF entre 32 et 40 pour pouvoir transmettre le signal du magnétoscope sur le téléviseur, par son intermédiaire.

④ **Prise d'entrée d'antenne (ENTREE ANTENNE)**
Y brancher le cordon d'antenne.

⑤ **Prise de téléviseur (TELEVISEUR)**
La relier à la prise audio/vidéo d'un téléviseur ou d'un autre appareil externe.

⑥ **Prise de CANAL PLUS (DECODEUR CANAL + AUTOMATIQUE)**
Y brancher le décodeur.

COMMUTATION DE L'ALIMENTATION SUR MARCHE/ARRET

COMMUTATION DE L'ALIMENTATION SUR MARCHE

Ce magnétoscope ne possède pas d'interrupteur d'alimentation. Il se commute automatiquement sur marche ou sur arrêt avec les opérations suivantes.

- Quand une cassette munie de son segment de protection est insérée.
  Le témoin (■) s'allume sur l'affichage. Si la cassette installée est dépourvue de son segment de protection, la lecture commence.
- Quand les touches +/– ou une des touches numériques de la télécommande est enfoncée.
  L'indication "Pr" et "F" apparaît sur l'affichage.
- Quand la touche LECTURE est enfoncée tandis qu'une cassette est déjà dans le logement.
  La lecture commence.
- Quand la touche EJECT. est enfoncée.
  Toute cassette installée et éjectée et le magnétoscope reste en mode d'arrêt.
- Quand la touche RET.RAP. ou AV.RAP. est enfoncée et qu'une cassette se trouve dans le logement. La bande se rebobine ou avance rapidement.
- Quand la touche TUNER de la télécommande est enfoncée.
  Le témoin "F" apparaît sur l'affichage.
- Quand la touche PAUSE/AR.IMAGE est enfoncée et qu'une cassette se trouve dans le logement. Une image gelée apparaît sur l'écran.
- Quand la touche ARRET est enfoncée et qu'une cassette se trouve dans le logement.
  Le témoin (■) s'allume sur l'affichage.
- Quand la touche ENR. est enfoncée et qu'une cassette se trouve dans le logement.
  Le témoin de pause (▶●II) apparaît sur l'affichage.

COMMUTATION DE L'ALIMENTATION SUR ARRET

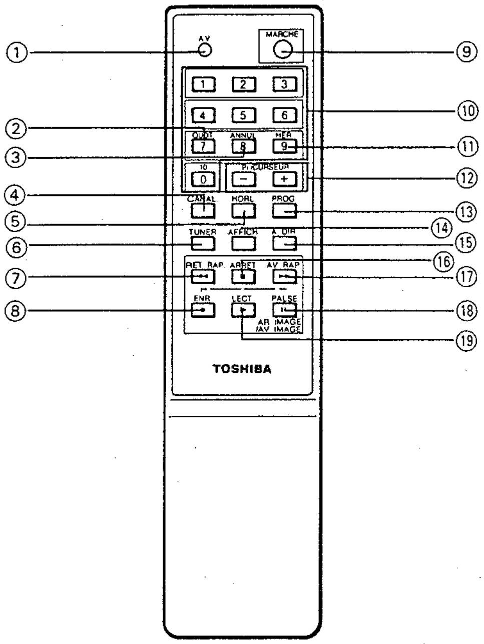
COUPURE DE L'ALIMENTATION

Appuyer sur la touche MARCHE de la télécommande.

COUPURE AUTOMATIQUE DE L'ALIMENTATION
Si toute touche relative à l'enregistrement par minuterie ou de défilement de bande est enfoncée dans les 15 minutes qui suivent l'installation d'une cassette dans le magnétoscope (celui-ci est en mode d'arrêt et le témoin d'arrêt (■) est allumé sur l'affichage), l'alimentation est automatiquement coupée (mode d'attente).

TELECOMMANDE

Les touches qui ne sont pas suivies d'explications trouvent leur équivalent sur le magnétoscope.



① **Touche d'audio/vidéo (A.V.)**

② **Touche de réglage quotidien de la minuterie (QUOT.)**
Pour répéter une programmation de la minuterie, chaque jour.

③ **Touche d'annulation (ANNUL)**
Pour annuler une programmation de la minuterie.

④ **Touche de canal (CANAL)**
Sert à la programmation d'un canal de télévision.

⑤ **Touche d'horloge (HORL)**
Sert à régler l'horloge.

⑥ **Touche de démodulateur (TUNER)**
Sert à relâcher la fonction de blocage ou à sélectionner l'entrée de l'antenne en mode de démodulateur.

⑦ **Touche de rebobinage rapide (RET.RAP.)**

⑧ **Touche d'enregistrement (ENR.)**

⑨ **Touche de marche (MARCHE)**
Pour faire passer le magnétoscope en mode d'attente ou pour activer la fonction de blocage.

⑩ **Touches numériques (1 - 0)**
Servent à sélectionner les canaux de télévision, l'entrée des données pour le réglage de l'horloge ou de l'enregistrement déclenché par minuterie.

⑪ **Touche de réglage hebdomadaire (HEB.)**
Pour répéter une programmation de la minuterie chaque semaine.

⑫ **Touche +/- de curseur (Pr/CURSEUR +/-)**
Sert de curseur pendant la correction de données ou sert à choisir les canaux de télévision.

⑬ **Touche de programmation (PROG.)**
Sert à sélectionner le mode de fonctionnement de la minuterie.
Appuyer sur cette touche avant d'enfoncer la touche QUOT., HEB. ou ANNUL.

⑭ **Touche d'affichage (AFFICH.)**

⑮ **Touche de défilement préréglé (A.DIR.)**
Enfoncer une fois pour afficher le compteur.
Enfoncer deux fois pour afficher la durée restante.

⑯ **Touche d'arrêt (ARRET)**

⑰ **Touche d'avance rapide (AV.RAP.)**

⑱ **Touche d'arrêt momentané/de gel d'image/d'avance image par image (PAUSE/AR.IMAGE/AV.IMAGE)**

⑲ **Touche de lecture (LECT.)**

FONCTION DE BLOCAGE

Cette fonction empêche les enfants de jouer avec le magnétoscope.

Activation de la fonction de blocage
Maintenir la touche MARCHE de la télécommande enfoncée pendant plus de 8 secondes, de façon que le témoin "FIN" apparaisse sur l'affichage. A ce moment, le magnétoscope devient inopérant.

Libération de la fonction de blocage
Appuyer sur la touche TUNER de la télécommande de façon que le témoin "FIN" s'éteigne sur l'affichage. A ce moment, le magnétoscope peut refonctionner.

PLAGE DE FONCTIONNEMENT

La télécommande doit avoir un trajet rectiligne vers le capteur, situé sur le magnétoscope. Elle doit se trouver à 30° de part et d'autre du centre de l'axe perpendiculaire. Quand la télécommande est pointée vers le panneau avant du magnétoscope, elle peut envoyer les ordres jusqu'à 7 mètres de distance (à 30° du centre, la distance de fonctionnement est de 5 mètres environ).

MISE EN PLACE DES PILES

1. Ouvrir le couvercle du logement à pile, sur le dos de la télécommande.
2. Installer 2 piles (R6) en respectant l'agencement des polarités.
3. Refermer le couvercle du logement.

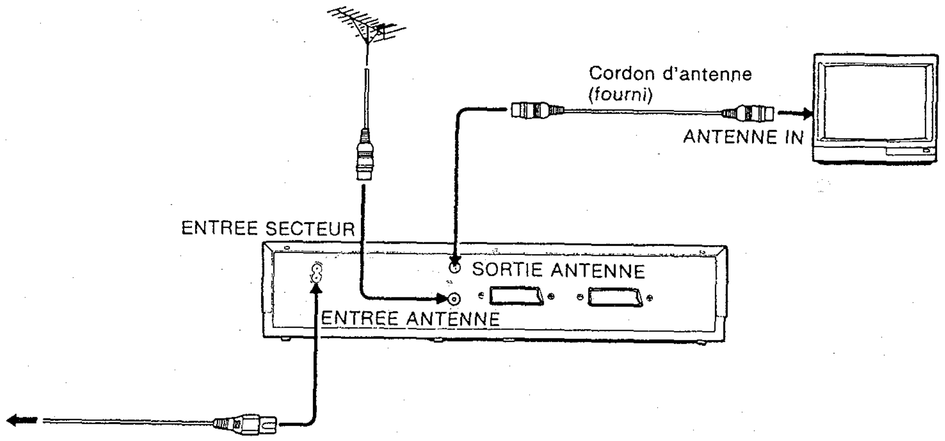
Remarques

- Quand la télécommande est utilisée, appuyer sur les touches en laissant au moins une seconde d'intervalle entre les enclenchements, pour assurer un fonctionnement correct de la télécommande.
- Si l'on prévoit de ne pas utiliser la télécommande pendant longtemps, enlever les piles pour éviter tout dommage éventuel dû à une corrosion des piles.
- Tenir la télécommande à l'écart des lieux extrêmement chauds ou humides et éviter les chocs mécaniques.
- Ne pas soumettre la télécommande à une source lumineuse puissante, comme le rayonnement solaire direct ou un autre éclairage.
- Les piles vont durer un an environ (leur durée de vie dépend des conditions d'utilisation).
- Si le magnétoscope ne fonctionne plus normalement, remplacer toutes les piles.
- Ne pas jeter les piles au feu.

CONNEXION D'ANTENNER/REGLAGE D'ACCORD

CONNEXION FONDAMENTALE

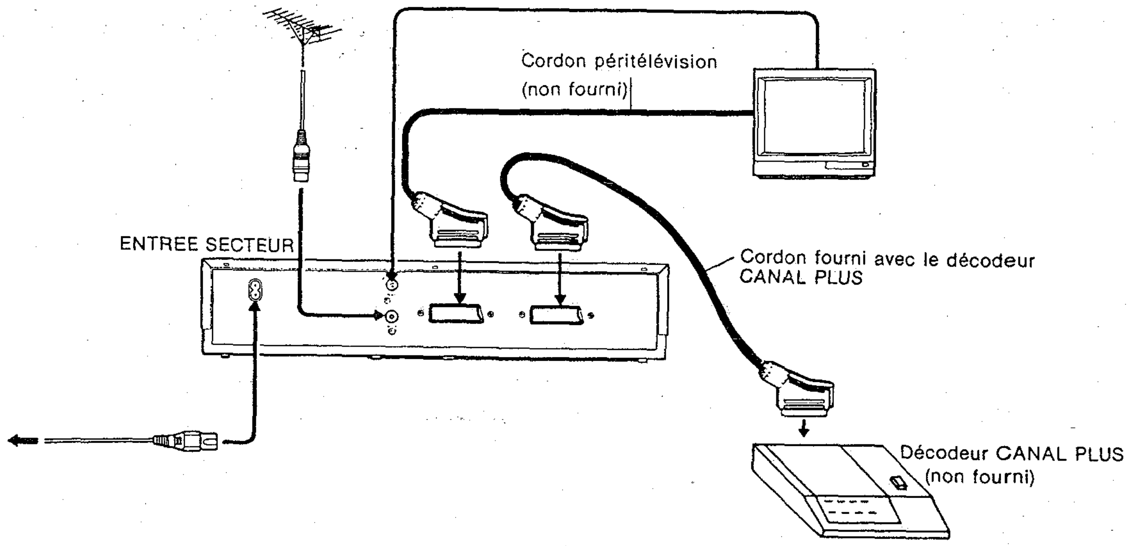
Quand le téléviseur n'est pas pourvu de prise vidéo/audio (péritélévision)


Cordon d'antenne
(fourni)
ANTENNE IN
ENTREE SECTEUR
SORTIE ANTENNE
ENTREE ANTENNE

1 Débrancher le cordon d'antenne du téléviseur et le brancher à la prise ENTREE ANTENNE du magnétoscope.
2 Raccorder la prise SORTIE ANTENNE du magnétoscope au téléviseur à l'aide du cordon d'antenne fourni.
3 Brancher le cordon d'alimentation fourni à la prise ENTREE SECTEUR du magnétoscope.

CONNEXION D'APPLICATION

Quand le téléviseur est pourvu d'une prise vidéo/audio (péritélévision)


Cordon péritélévision
(non fourni)
ENTREE SECTEUR
Cordon fourni avec le décodeur CANAL PLUS
Décodeur CANAL PLUS
(non fourni)

Relier la prise TELEVISEUR du magnétoscope à la prise audio/vidéo du téléviseur, à l'aide du cordon péritélévision.

Connexion CANAL PLUS

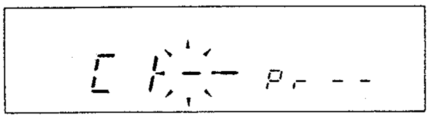
Relier la prise CANAL PLUS du magnétoscope au décodeur CANAL PLUS, à l'aide du cordon fourni avec le décodeur.

ACCORD DU TELEVISEUR SUR LE CANAL DE SORTIE DU MAGNETOSCOPE

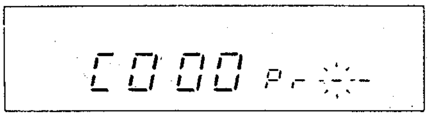
Le convertisseur RF du magnétoscope change, pendant la lecture, les signaux vidéo et audio d'une bande vidéo précédemment enregistrée en signaux du même type que ceux utilisés dans les émissions télévisées.
Le canal de sortie RF du magnétoscope est réglé en usine aux alentours du canal UHF 36. Par conséquent, régler le téléviseur sur le canal 36 pour recevoir les signaux en provenance du magnétoscope.

Marche à suivre

1 Relier le téléviseur au magnétoscope.
2 Mettre le magnétoscope sous tension en enfonçant une des touches numériques ou en installant une cassette.
3 Appuyer la touche CANAL de la télécommande (pendant 2 secondes environ) jusqu'à ce que les indications suivantes apparaissent sur l'affichage.



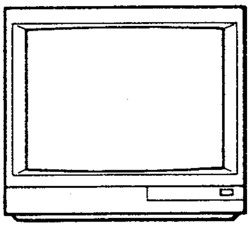
4 Appuyer sur la touche 0000 du magnétoscope pendant 6 secondes environ.



Remarque
L'affichage change automatiquement 6 secondes plus tard.

- Mode d'horloge: ex. 15:30 C000
- Mode de compteur: ex. C000 E180 (2:40)

5 Accorder le téléviseur aux alentours du canal UHF 36, de façon que la mire apparaisse sur l'écran comme illustré.



- Si la mire est parasitée, régler le convertisseur RF sur un canal inutilisé pour les émissions, à l'aide du réglage de canal UHF, situé sur le panneau arrière du magnétoscope. Ensuite, accorder le téléviseur sur le nouveau canal et choisir ce canal sur le téléviseur.

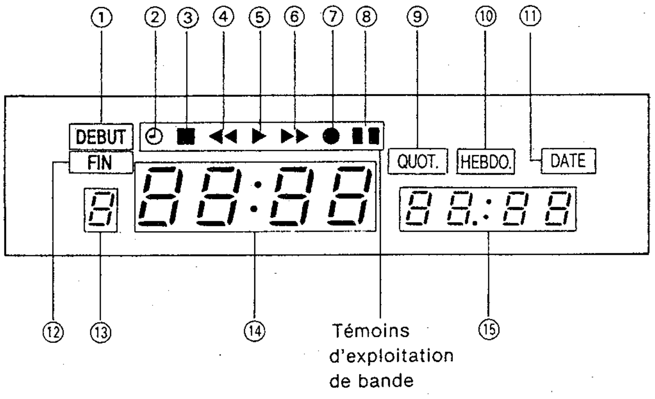
6 Appuyer sur une des touches numériques de façon que la mire disparaisse.
L'accord du téléviseur est terminé.

Remarque
Quand la prise TELEVISEUR du magnétoscope est reliée à la prise audio/vidéo du téléviseur, les démarches ci-dessus sont inutiles. Dans ce cas, régler le téléviseur en mode d'entrée audio/vidéo.

ALLOCATION DES CANAUX

VHF	Numéro de canal de télévision	1-02	1-03	1-04	1-05	1-06	1-07	1-08	1-09	1-10
	Station de télévision	FB	FC1	FC	F1	F2	F3	F4	F5	F6
UHF	Numéro de canal de télévision	1-21	1-22	1-23	---------------			1-67	1-68	1-69
	Station de télévision	E21	E22	E23	---------------			E67	E68	E69
CATV	Numéro de canal de télévision	1-81	1-82	1-83	---------------			1-93	1-94	1-95
	Station de télévision	C	D	E	---------------			O	P	Q
CATV	Numéro de canal de télévision	2-71	2-72	2-73	---------------			2-84	2-85	2-86
	Station de télévision	71	72	73	---------------			84	85	86

AFFICHAGE



① **Témoin de commencement (DEBUT)**
S'allume lors du réglage du moment de mise en marche de la minuterie.

② **Témoin de la minuterie (◷)**
S'allume en mode de minuterie.

③ **Témoin d'arrêt (■)**
S'allume en mode d'arrêt.

④ **Témoin de rebobinage (◀◀)**
S'allume en mode de rebobinage ou de recherche en arrière.

⑤ **Témoin de lecture (▶)**
S'allume en mode de lecture, d'image fixe, de lecture au ralenti, d'avance image par image, ou de mode de recherche arrière ou avant.

⑥ **Témoin d'avance rapide (▶▶)**
S'allume en mode d'avance rapide ou de recherche en avant.

⑦ **Témoin d'enregistrement (●)**
S'allume en mode d'enregistrement.

⑧ **Témoin d'arrêt momentané (▮▮)**
S'allume en mode d'arrêt momentané ou d'image fixe.

⑨ **Témoin de réglage quotidien (QUOT.)**
S'allume lors du réglage quotidien de la minuterie.

⑩ **Témoin de réglage hebdomadaire (HEBDO.)**
S'allume lors du réglage hebdomadaire de la minuterie.

⑪ **Témoin de la date (DATE)**
S'allume lors du réglage de l'horloge.

⑫ **Témoin du moment de mise à l'arrêt (FIN)**
S'allume lors du réglage du moment de mise à l'arrêt de la minuterie, du lancement de l'enregistrement immédiat ou de l'activation de la fonction de blocage.

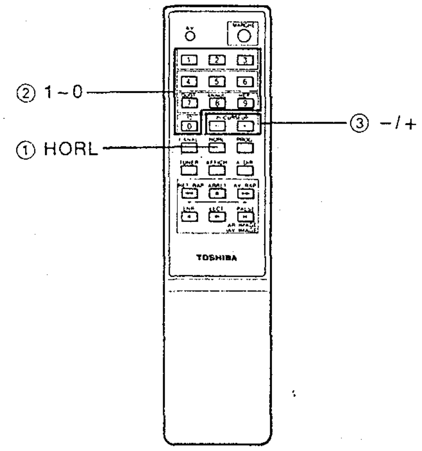
⑬ **Témoin du compteur/de fréquence/de numéro de programme**

- "C" apparaît quand le compteur de bande est affiché.
- "F" apparaît quand une émission télévisée est choisie.
- Indique le numéro de programme lors du réglage de programmation de la minuterie.

⑭ **Témoin de compteur de bande/d'horloge/de numéro de position/de numéro de canal/de numéro de système**
Indique le relevé du compteur de bande, l'heure réelle, le numéro de position, le numéro de canal, ou le numéro de système.

⑮ **Témoin de durée restante/de type de cassette/de numéro de canal/de numéro de position**
Indique la durée restante, le type de cassette, le numéro de canal, ou le numéro de position.

REGLAGE DE L'HORLOGE

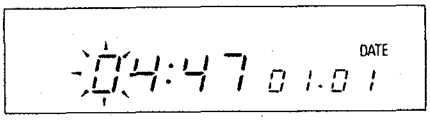

② 1 ~ 0
① HORL
③ − / +
TOSHIBA

Le réglage de l'horloge fait partie des opérations de base. Régler l'horloge par la télécommande.

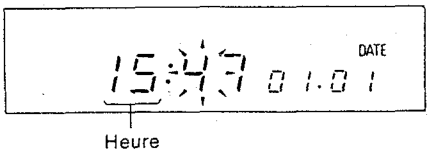
REGLAGE DE L'HORLOGE/ DATE/ANNEE

Par exemple: Pour régler l'horloge sur 15:30, le 28 avril 1990.

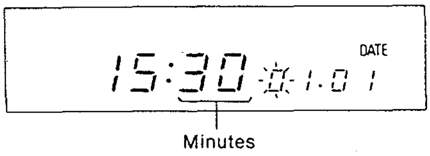
1 Appuyer sur la touche HORL ①.


04:47 01.01
DATE

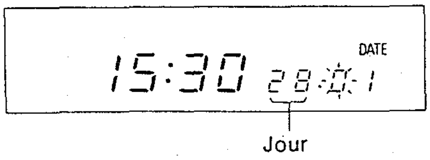
2 Pour régler les heures, appuyer sur les touches numériques 1 et 5 ②.


15:47 01.01
DATE
Heure

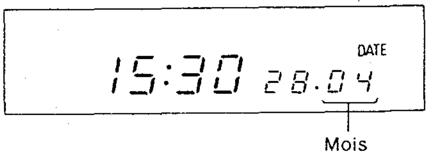
3 Pour régler les minutes appuyer sur les touches numériques 3 et 0 ②.


15:30 01.01
DATE
Minutes

4 Pour régler le jour, appuyer sur les touches numériques 2 et 8 ②.

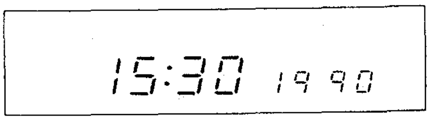

15:30 28.01
DATE
Jour

5 Pour régler le mois, appuyer sur les touches numériques 0 et 4 ②.

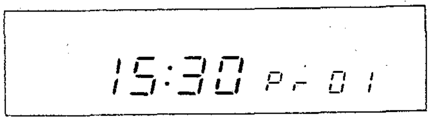

15:30 28.04
DATE
Mois

Les indications du jour et du mois font automatiquement place à l'indication de l'année et le chiffre de l'extrême droit clignote (le dernier chiffre de l'année).

6 Pour régler l'année, changer la position clignotante à la position initiale avec la touche ③. Ensuite, appuyer sur les touches numériques 1, 9, 9 et 0 ②.



7 Appuyer de nouveau sur HORL ①.



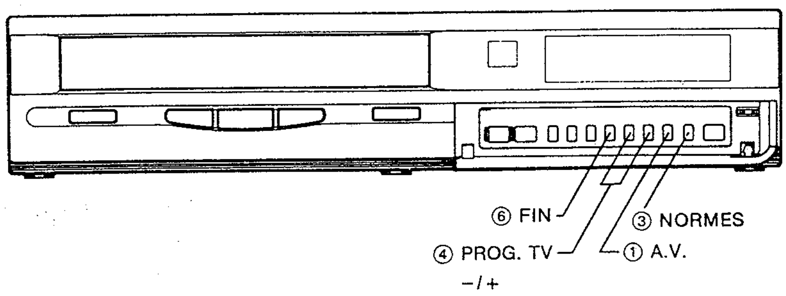
L'horloge se met à fonctionner.

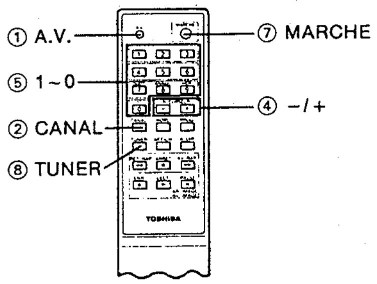
- Lors du réglage de l'horloge en mode compteur, l'affichage revient automatiquement au mode compteur à la fin du réglage.

Remarque

Si le réglage de l'horloge doit être modifié pendant cette opération, utiliser la touche − ou + ③. L'enclenchement de la touche − ③ fait reculer le clignotement, tandis qu'une poussée sur la touche + ③ le fait avancer.

SELECTION DES CANAUX





Le tuner de ce magnétoscope est un tuner "FS" (synthétisé en fréquence), capable de recevoir les canaux de télévision VHF, UHF et de télédistribution.
Le canal VHF/UHF ou de télédistribution est choisi par la touche NORMES du magnétoscope (se reporter à "ALLOCATION DES CANAUX". A l'usage d'un décodeur, les programmes de CANAL PLUS peuvent être reçus (pour le raccordement.
Il est indispensable de prérégler les canaux de télévision avant de pouvoir les sélectionner.

Préparatifs
Si l'indication "AV" apparaît sur l'affichage, appuyer sur la touche A.V. ① de façon qu'elle disparaisse.

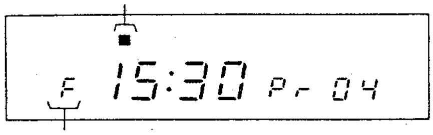
PREREGLAGE DES CANAUX

Il est possible de prérégler un maximum de 39 stations de télévision à l'aide de la télécommande.

Par exemple: Pour régler le canal UHF 27 sur la position 8.

1 Mettre le magnétoscope sous tension.

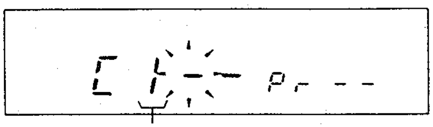
s'allume quand une cassette est installée et laissée telle quelle.



apparaît à la mise sous tension, avec la touche TUNER enfoncée.

Régler le magnétoscope en mode de préréglage.

2 Maintenir la touche CANAL ② enfoncée (pendant 2 secondes environ), de façon que les indications suivantes apparaissent.

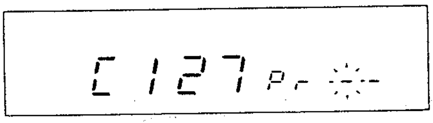


Numéro de système
1: VHF/UHF ou télédistribution
2: Télédistribution

Remarque
Pour recevoir un programme de la télédistribution, appuyer sur la touche NORMES ③ de façon que l'indication "1" (C - Q) ou "2" (71 - 86) apparaisse.

Entrer le numéro de canal de télévision.

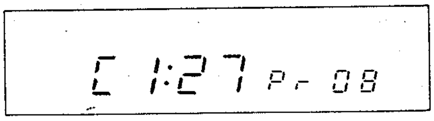
3 Appuyer sur la touche + ou - ④ dans les 6 secondes qui suivent, pour trouver le canal 27.
- Appuyer sur la touche + pour passer dans les canaux supérieurs et sur la touche - pour passer dans les canaux inférieurs.



Si la procédure n'est pas réalisée dans les 6 secondes, l'indication "Pr" change.

Entrer le numéro de position.

4 Appuyer sur la touche numérique 0 ⑤ dans les 6 secondes qui suivent. Ensuite, appuyer sur la touche numérique 8 ⑤ pendant plus de 2 secondes, de façon que l'indication "08" cesse de clignoter. Les données sont mémorisées.
Le préréglage est terminé.

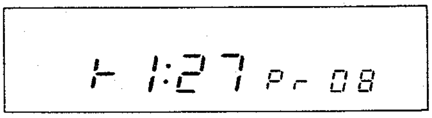


5 Répéter les étapes 1 à 4 pour prérégler un autre canal.

Remarque
Si les procédures ne sont pas réalisées dans les 6 secondes, l'indication change. recommencer le réglage depuis le début.

Préréglage de CANAL PLUS

Appuyer sur la touche A.V. ① de la télécommande, de façon que l'indication "⊢" apparaisse avant d'entrer le numéro de position, à l'étape 4.



PREREGLAGE DES CANAUX (après préréglage)

Sélection d'un canal par le numéro de position

Appuyer sur les touches +/− ④ ou les touches numériques (1 — 0) ⑤ de la télécommande, pour choisir le numéro de position.

Pr 08

Pour choisir le canal tout en vérifiant le numéro de canal et le numéro de position

Appuyer sur la touche CANAL ②, puis sur les touches +/− ④.

C 1:27 Pr 08

Remarques

- Si l'intervalle entre les démarches successives dépasse 6 secondes, l'affichage courant repasse à l'affichage original.
- Quand CANAL PLUS est préréglé, l'indication "ⱶ" apparaît.

ACCORD FIN

Cette fonction est rarement utilisée.

Utiliser cette fonction quand l'image est mauvaise.

Exemple: Pour régler plus précisément l'image de la position 8.

Affichage original

F 15:30 Pr 08

1 Appuyer sur la touche FIN ⑥ du magnétoscope. Le numéro du canal de télévision apparaît.

F1 -- C 127

Le canal 27 a été préréglé sur la position 8.

2 Appuyer sur les touches +/− ④ dans les 6 secondes qui suivent, pour obtenir une image satisfaisante.

3 Appuyer sur la touche numérique 0 ⑤ de la télécommande dans les 6 secondes qui suivent. Ensuite, appuyer sur la touche numérique 8 ⑤ pendant 2 secondes environ, de façon que l'indication "08" cesse de clignoter.

L'accord fin est terminé.

C 1:27 Pr 08

POUR EVITER UNE MISE HORS TENSION PENDANT LA RECEPTION D'UNE EMISSION TELEVISEE

Si un programme télévisé est en cours de réception et qu'une cassette est installée, la fonction de mise hors tension automatique s'active et va couper l'alimentation de l'appareil. Pour éviter ce problème, enlever la cassette avant de lancer les autres opérations.

Pour pouvoir regarder une émission télévisée avec une cassette dans l'appareil, procéder comme suit.

1 Appuyer sur la touche MARCHE ⑦ de la télécommande de façon que l'appareil soit mis hors tension (mode d'attente).

15:30 10

2 Appuyer sur la touche TUNER ⑧ +/− ④, CANAL ② ou une des touches numériques ⑤ de la télécommande, de façon que l'indication "F" apparaisse sur l'affichage.

- Quand les touches numériques 1 à 0 ⑤ ou la touche CANAL ② est enfoncée, l'indication "Pr" apparaît sur l'affichage pendant 6 secondes environ.

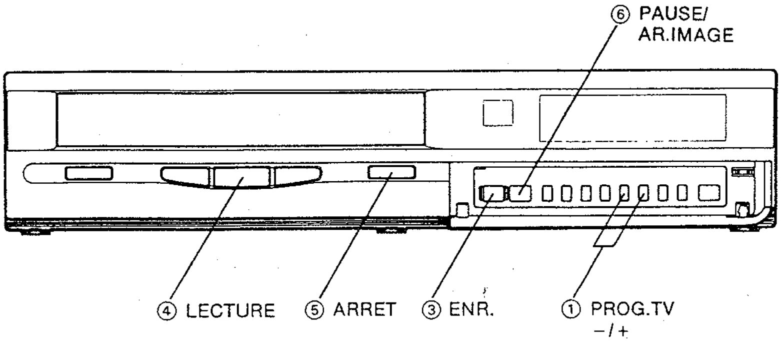
F 15:30 Pr 01

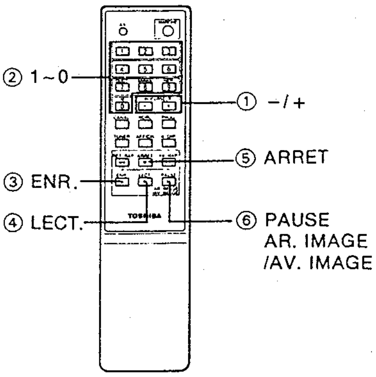
Tant que l'indication "F" reste visible, la fonction de mise hors tension automatique est inopérante.

Remarques

- Pour éteindre l'indication "F", installer une cassette ou appuyer sur une touche quelconque du fonctionnement de bande.
- L'indication "F" n'apparaît pas en mode d'exploitation de bande (arrêt, enregistrement, lecture, etc.).

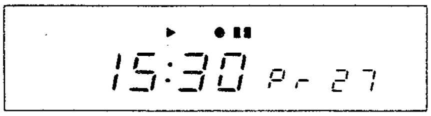
ENREGISTREMENT



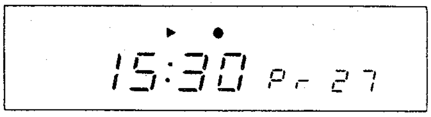


ENREGISTREMENT D'UN PROGRAMME TELEVISE TOUT EN LE REGARDANT

1 Insérer une cassette munie de son segment de protection.
2 Choisir le programme télévisé à enregistrer par les touches +/− ① ou les touches numériques 1 à 0 ② de la télécommande.
3 Appuyer sur la touche ENR. ③.
Le magnétoscope entre en mode de pause à l'enregistrement.



4 Appuyer sur la touche LECTURE ④.
L'enregistrement commence.



5 Appuyer sur la touche ARRET ⑤ après que l'enregistrement est terminé.

Remarques

- Si la touche ENR. ③ est enfoncée deux fois, le magnétoscope entre en mode d'enregistrement immédiat Pour reprendre l'enregistrement normal, appuyer sur la touche PAUSE/AR.IMAGE ⑥, puis sur la touche LECTURE ④.
- Quand la touche LECTURE ④ est maintenue enfoncée (pendant 3 secondes), l'enregistrement répété s'active .
- Pour changer de programme au cours de l'enregistrement, appuyer sur la touche PAUSE/AR.IMAGE ⑥. Choisir un autre programme de télévision par les touches +/− ① ou les touches numériques 1 à 0 ② et appuyer sur la touche LECTURE ④.
- Quand la touche PAUSE/AR. IMAGE ⑥ est enfoncée, le magnétoscope entre en mode de pause. Cette fonction est pratique pour sauter des parties que l'on ne souhaite pas enregistrer. Le magnétoscope entre automatiquement en mode d'arrêt 4 minutes après que la touche ⑥ a été enfoncée, ceci pour protéger la bande.

ENREGISTREMENT D'UN PROGRAMME TELEVISE TOUT EN REGARDANT UN AUTRE

Si deux programmes intéressants sont émis simultanément, il est possible de regarder un programme tout en enregistrant l'autre.

Lancer l'enregistrement en suivant les étapes 1 à 4 du paragraphe "ENREGISTREMENT D'UN PROGRAMME TELEVISE TOUT EN LE REGARDANT", puis choisir le canal de télévision à regarder par le sélecteur de canal du magnétoscope.

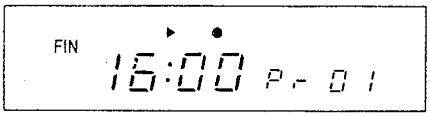
Pour surveiller l'enregistrement, régler le téléviseur sur le canal vidéo.

ENREGISTREMENT

ENREGISTREMENT IMMEDIAT

Cette fonction permet de régler facilement le moment de l'arrêt de l'enregistrement. La durée de l'enregistrement se règle par tranches de 20 minutes, jusqu'à concurrence de 1.440 minutes (soit 24 heures).

1 Appuyer sur la touche ENR.
  Le magnétoscope entre en mode de pause à l'enregistrement.
2 Appuyer de nouveau sur la touche ENR. L'arrêt après 20 minutes apparaît.
  L'enregistrement commence.



L'enregistrement s'arrête à 16 heures.

3 A chaque poussée sur la touche ENR., la durée change par tranches de 20 minutes, jusqu'à totaliser 1.440 minutes. Régler la durée souhaitée.

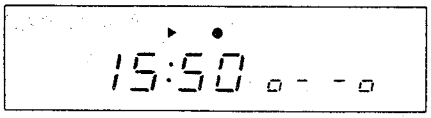
Annulation de l'enregistrement immédiat

Appuyer sur la touche LECTURE.
Le magnétoscope repasse en mode d'enregistrement normal.

ENREGISTREMENT REPETE

Quand cette fonction est utilisée au cours de l'enregistrement, le magnétoscope rebobine automatiquement la bande quand elle est terminée et recommence l'enregistrement à partir du début de la bande.

1 Appuyer sur la touche LECTURE (pendant 6 secondes environ).
  Le magnétoscope entre en mode d'enregistrement répété.



2 Après avoir enregistré jusqu'à la fin de la bande, le magnétoscope rebobine automatiquement la bande et commence à enregistrer à partir du début.

3 Pour repasser au mode d'enregistrement normal, appuyer sur la touche PAUSE/AR.IMAGE, puis sur la touche LECTURE.

ATTENTION
Avant de lancer l'enregistrement répété, vérifier que la bande ne contient pas d'informations importantes.

ENREGISTREMENT D'UN PROGRAMME DU CANAL PLUS

Ce magnétoscope peut recevoir et enregistrer les programmes du CANAL PLUS.
Raccorder le décodeur CANAL PLUS comme illustré en.

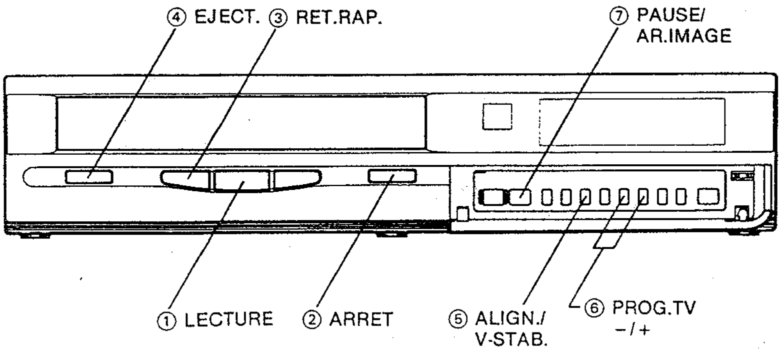
Préparatifs

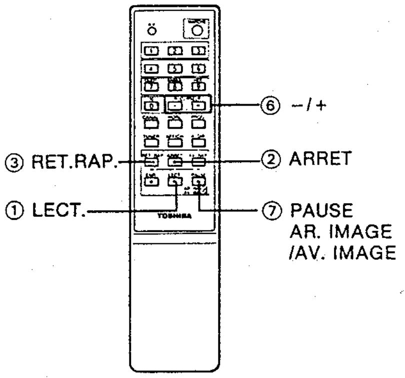
1 Mettre le décodeur, le magnétoscope et le téléviseur sous tension.
2 Prérégler le programme de CANAL PLUS.

Enregistrement

Suivre les démarches en.

LECTURE





1 Insérer une cassette enregistrée munie de son segment de protection.
Le magnétoscope se met sous tension.

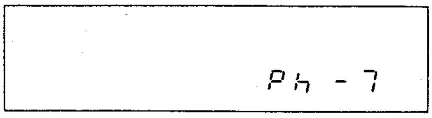
Remarque
Quand une cassette démunie de son segment est installée, le magnétoscope lance immédiatement la lecture de cette cassette et rebobine la bande quand la lecture est arrivée à la fin de la bande.

2 Appuyer sur la touche LECTURE ①.
La lecture commence.
3 Quand la lecture est terminée, appuyer sur la touche ARRET ②.
4 Appuyer sur la touche RET.RAP ③ pour rebobiner la bande.
5 Appuyer sur la touche EJECT. ④ pour retirer la cassette.

REGLAGE D'ALIGNEMENT

Lors de la lecture d'une bande enregistrée sur un autre magnétoscope, il se peut que l'image soit légèrement déformée, mais ces distorsions peuvent s'éliminer facilement.

1 Pendant la lecture, appuyer sur la touche ALIGN./ V-STAB. ⑤ du magnétoscope.
2 Ajuster l'alignement par les touches +/- ⑥.
3 Le réglage est indiqué par l'affichage de l'indication "Ph", suivie d'un chiffre -7 <0> 7.

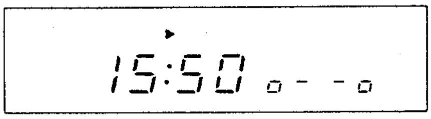


4 Surveiller l'image tout en appuyant sur la touche +/- ⑥. Quand l'image est réglée au mieux, relâcher la touche ⑥ enfoncée. Quelques secondes plus tard, l'affichage repasse à l'affichage normal.
Dans le cas d'une cassette enregistrée sur ce magnétoscope, le réglage optimum est obtenu quand "0" apparaît.

LECTURE REPETEE

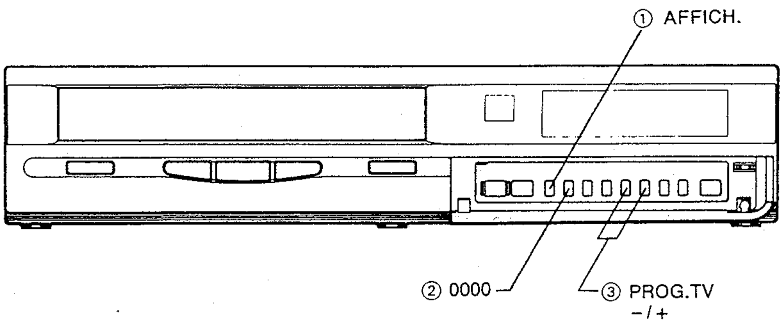
Quand cette fonction est utilisée au cours de la lecture, le magnétoscope rebobine automatiquement la bande quand elle est terminée et recommence la lecture à partir du début de la bande.

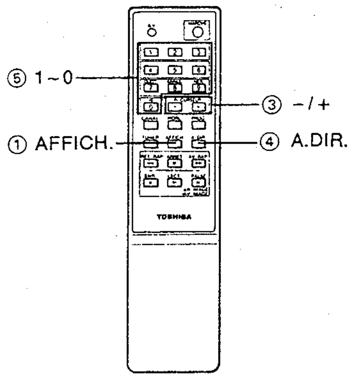
1 Appuyer sur la touche LECTURE ① (pendant 6 secondes environ).
Le magnétoscope entre en mode de lecture répétée.



2 Après avoir reproduit la bande jusqu'à la fin, le magnétoscope rebobine automatiquement la bande et recommence la lecture à partir du début.
3 Pour repasser au mode de lecture normal, appuyer sur la touche PAUSE/AR.IMAGE ⑦, puis sur la touche LECTURE ①.

AFFICHAGE DU COMPTEUR/FONCTION A.DIR.



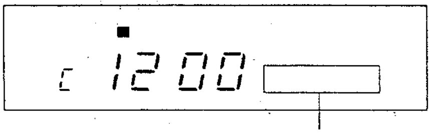


COMPTEUR

Ce magnétoscope est doté d'un compteur électronique. L'affichage est contrôlé par la touche AFFICH. ①.
Le compteur se réinitialise automatiquement sur "0000" si
— une cassette est insérée.
— la cassette est complètement rebobinée.
Pour réinitialiser le compteur en tout autre point de la bande, par exemple, lorsqu'on procède à un nouvel enregistrement, appuyer simplement sur la touche 0000 ② du magnétoscope.

Pour passer de l'affichage de l'heure à l'affichage du compteur et vice versa, appuyer sur la touche AFFICH. ①.

Exemple: Affichage en mode compteur



Cassette de type E180
Durée restante 1:30

Remarque: L'affichage du magnétoscope passe automatiquement du type de cassette à la durée restante.

Pour sélectionner le type de cassette manuellement, appuyer sur la touche + ③ dans les 6 secondes après que le mode compteur est sélectionné par la touche AFFICH. ①. Chaque poussée sur la touche ③, l'affichage du type de cassette et du compteur change.

FONCTION A.DIR.

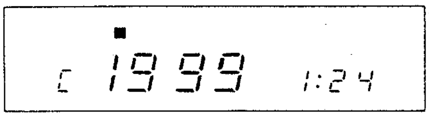
Le compteur électronique est extrêmement précis et permet d'utiliser la fonction A.DIR. de la télécommande, dans le but de bobiner la bande jusqu'à un certain point. Pour que cette fonction fonctionne correctement, le magnétoscope doit avoir déterminé le relevé du compteur courant, ainsi que la durée restante.

Pour utiliser cette fonction afin de trouver un point particulier de la bande, appuyer sur la touche A.DIR. ④ de la télécommande.
Une poussée: Le relevé du compteur à atteindre apparaît.
Deux poussées: La durée restante apparaît.

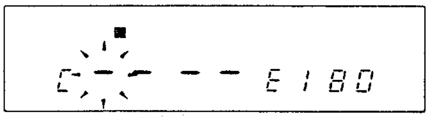
SELECTION DU RELEVE DU COMPTEUR A ATTEINDRE

Exemple: Pour régler le compteur sur 2500

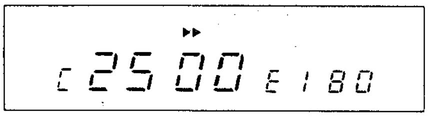
Relevé courant 1999



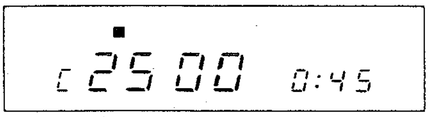
1 Appuyer sur la touche A.DIR. ④.



2 Appuyer sur les touches numériques 2, 5, 0 et 0 ⑤ de la télécommande, dans les 6 secondes qui suivent.



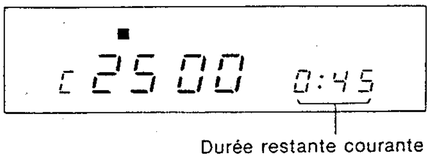
3 Le compteur change de 1999 à 2500.



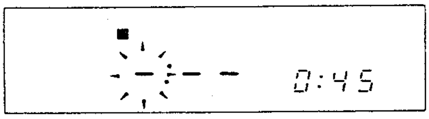
La bande est automatiquement bobinée au point 2500 et s'y arrête.

SELECTION DE LA DUREE RESTANTE

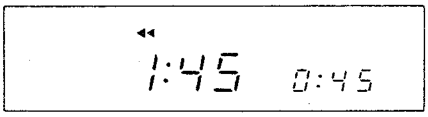
Exemple: Pour régler la durée restante sur 1:45
Durée restante courante: 45 minutes



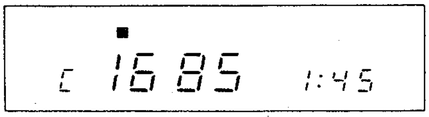
1 Appuyer deux fois sur la touche A.DIR. ④ de façon à faire apparaître l'indication suivante.



2 Appuyer sur les touches numériques 1, 4 et 5 ⑤ dans les 6 secondes qui suivent.

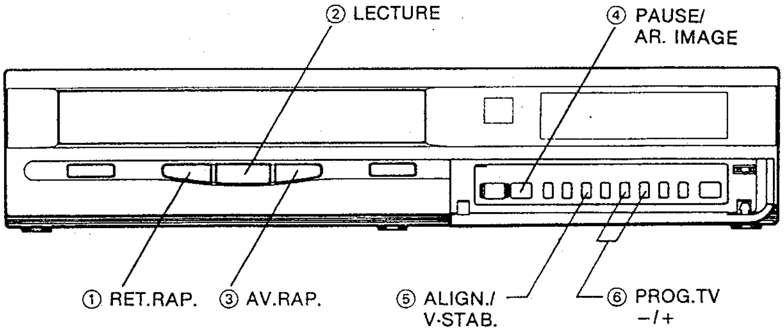


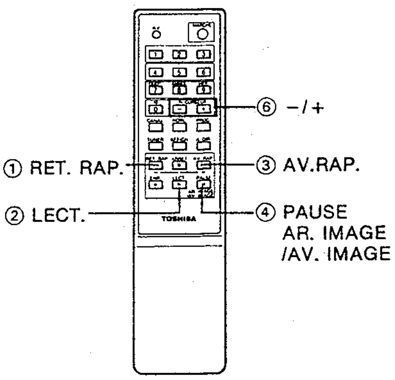
3 Le compteur change de 0:45 (durée restante courante) à 1:45 (durée restante souhaitée).



La bande se rebobine automatiquement et s'arrête au point de la durée restante 1:45.

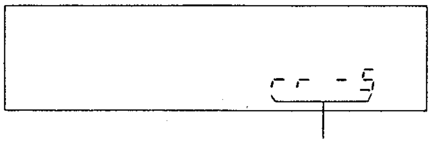
LECTURE SPECIALE





RECHERCHE

Si la touche RET.RAP. ou AV.RAP ① ③ est enfoncée pendant la lecture, la bande va défiler 5 fois plus vite que normalement, dans le sens correspondant à la touche enfoncée. L'indication "rr5" apparaît sur l'affichage (avant ou arrière).

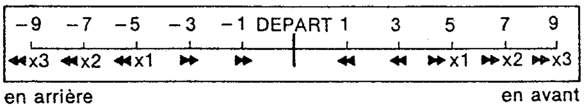


Indication de la recherche

Remarques

- En mode de compteur, l'indication de la recherche fait place à l'indication de la durée restante, 6 secondes plus tard.
- En mode d'horloge, l'indication de la recherche disparaît automatiquement environ 6 secondes plus tard.

Une nouvelle poussée sur la touche RET.RAP. ou AV.RAP ① ③ permet de sélectionner d'autres vitesse de défilement, à savoir, 1, 3, 5, 7, et 9 fois la vitesse normale. La vitesse change à chaque poussée sur la touche RET.RAP. ou AV.RAP ① ③.
Une poussée sur la touche du sens de défilement opposé ralentit la vitesse de la manière illustré ci-dessous.



L'image risque d'être parasitée par des traînées, mais ce phénomène n'est pas une anomalie de l'appareil. Cette fonction s'avère pratique pour localiser une image particulière sur la bande.

Remarque

Quand la touche RET.RAP. ou AV.RAP ① ③ est enfoncée en mode d'arrêt, la bande se rebobine ou avance rapidement sans que les images soient visibles sur l'écran.

IMAGE FIXE

1 Appuyer sur la touche PAUSE/AR.IMAGE ④ au cours de la lecture.
La bande s'arrête de défiler et une image "gelée" apparaît sur l'écran.
2 Pour reprendre la lecture normale, appuyer sur la touche LECTURE ②.

Remarque

Une image reste immobile pendant deux minutes environ. Les images changent environ toutes les deux minutes (avance image par image).

AVANCE IMAGE PAR IMAGE

1 Appuyer sur la touche LECTURE ② pour placer le magnétoscope en mode de lecture.
2 Appuyer sur la touche PAUSE/AR.IMAGE ④ pour placer le magnétoscope en mode d'image fixe.
3 Appuyer de nouveau sur la touche PAUSE/AR.IMAGE ④.
Chaque poussée fait avancer les images une par une.
4 Pour reprendre la lecture normale, appuyer de nouveau sur la touche LECTURE ②.

STABILITE DE L'IMAGE

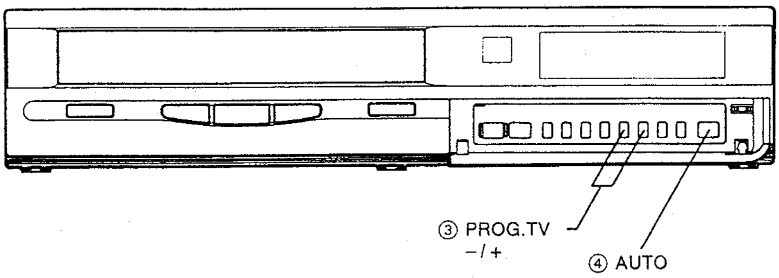
Quand la touche PAUSE/AR.IMAGE ④ est enfoncée la première fois, l'image peut être déformée légèrement dans le sens vertical ou tremblotter à cause des différentes caractéristiques des téléviseurs. Il est possible d'atténuer ce phénomène en réglant le magnétoscope.

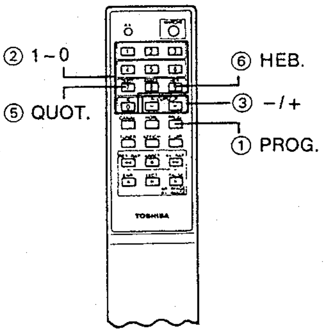
1 Appuyer sur la touche PAUSE/AR.IMAGE ④, puis sur la touche ALIGN./V-STAB. ⑤ du magnétoscope.
2 L'indication "A.O" apparaît sur l'affichage.
3 Appuyer sur la touche + ou − ⑥.
Le papillottage s'accentue ou diminue.
4 Maintenir la pression sur la touche ⑥ jusqu'à ce que l'image se stabilise.

Remarque

L'image fixe risque de tremblotter si une image est immobilisée en mode d'avance rapide. Ce phénomène n'est pas une anomalie du fonctionnement de l'appareil.

ENREGISTREMENT DECLENCHE PAR MINUTERIE


③ PROG.TV
–/+
④ AUTO


② 1~0
⑤ QUOT.
⑥ HEB.
③ –/+
① PROG.

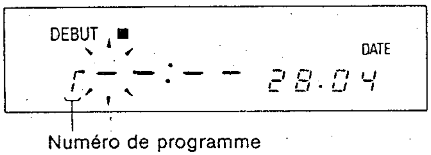
Il est possible de programmer huit enregistrements et ce, jusqu'à un an à l'avance.
Le magnétoscope est conçu pour que le réglage de la minuterie ne puisse s'effectuer qu'à partir de la télécommande.

Exemple: Réglage de la minuterie pour enregistrer un programme télévisé du canal 27 (préréglé sur la position 8) en tant que programme n°1, de 20:15 à 21:15, le 4 mai et le jour courant est le 28 avril.

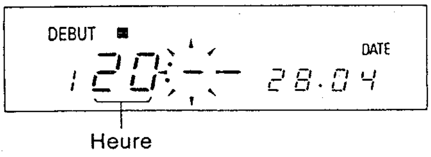
1 Insérer une cassette munie de son segment de protection.

Régler l'heure de mise en marche de la minuterie.

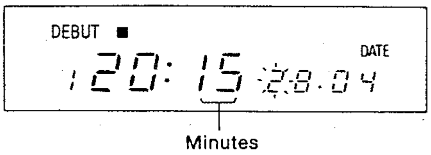
2 Appuyer sur la touche PROG. ① de la télécommande de façon que l'indication "DEBUT" s'allume.


DEBUT ■
DATE
-- : -- 28.04
Numéro de programme

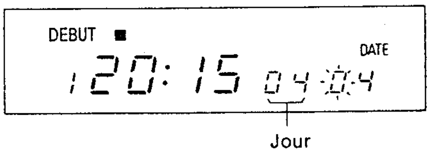
3 Pour régler l'heure, appuyer sur les touches numériques 2 et 0 ②.


DEBUT ■
DATE
1 20:-- 28.04
Heure

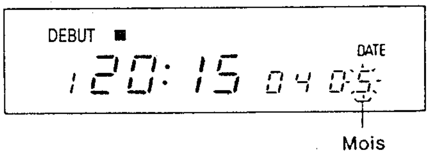
4 Pour régler les minutes, appuyer sur les touches numériques 1 et 5 ②.


DEBUT ■
DATE
1 20:15 28.04
Minutes

5 Pour régler le jour, appuyer sur les touches numériques 0 et 4 ②. (0 est indispensable).

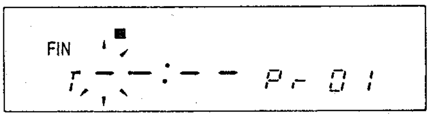

DEBUT ■
DATE
1 20:15 04.04
Jour

6 Pour régler le mois, appuyer sur les touches numériques 0 et 5 ②.

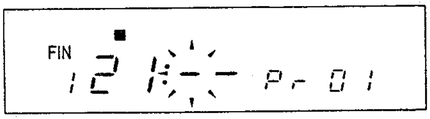

DEBUT ■
DATE
1 20:15 04 05
Mois

Régler l'heure de mise à l'arrêt de la minuterie.

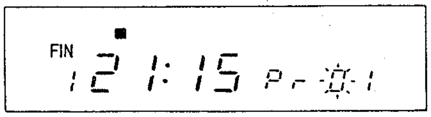
7 Appuyer sur la touche PROG. ① ou sur la touche + ③ de façon que l'indication "FIN" s'allume.



8 Pour régler l'heure, appuyer sur les touches numériques 2 et 1 ②.

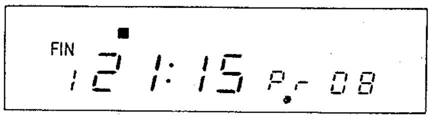

FIN ■
1 21:-- Pr 01

9 Pour régler les minutes, appuyer sur les touches numériques 1 et 5 ②.


FIN ■
1 21:15 Pr 01

Choisir le programme télévisé.

10 Appuyer sur les touches numériques 0 et 8 ② pour choisir le numéro de position du canal de télévision souhaité.



Remarque

Après le réglage de la dernière position, le clignotement revient sur la position précédente.

11 Répéter les étapes 2 à 10 pour prérégler d'autres programmes.

12 Appuyer sur la touche AUTO. ④ du magnétoscope de façon que le témoin de l'heure(◷)et le numéro de programme apparaissent sur l'affichage. L'enregistrement s'effectue au moment préréglé et la programmation s'efface ensuite automatiquement.

ENREGISTREMENT QUOTIDIEN

Il est possible d'enregistrer un programme télévisé chaque jour, à la même heure.
Appuyer sur la touche QUOT. ⑤ de la télécommande avant d'effectuer les étapes 2 à 10 du paragraphe "ENREGISTREMENT DECLENCHE PAR MINUTERIE".

ENREGISTREMENT HEBDOMADAIRE

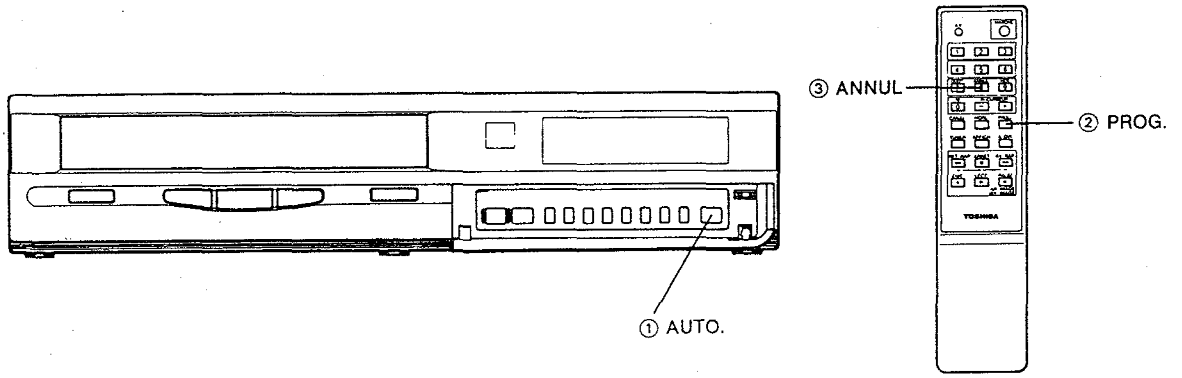
Il est possible d'enregistrer un programme télévisé chaque semaine, le même jour.
Appuyer sur la touche HEB. ⑥ de la télécommande avant d'effectuer les étapes 2 à 10 du paragraphe "ENREGISTREMENT DECLENCHE PAR MINUTERIE".

Pour libérer l'enregistrement par minuterie avant l'étape 12 du paragraphe "ENREGISTREMENT DECLENCHE PAR MINUTERIE"
Appuyer sur la touche AFFICH.

Remarque sur la mise hors tension automatique

L'alimentation se coupe automatiquement si aucune touche n'est enclenchée en mode d'arrêt (avec le témoin (■) allumé), dans les 15 minutes qui suivent l'insertion d'une cassette.

RENSEIGNEMENTS SUPPLEMENTAIRES SUR L'ENREGISTREMENT DECLENCHE PAR MINUTERIE

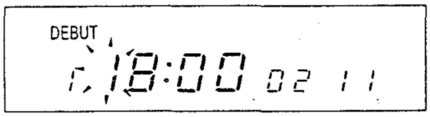


POUR CHANGER LE PROGRAMME APRES AVOIR REGLE LA MINUTERIE

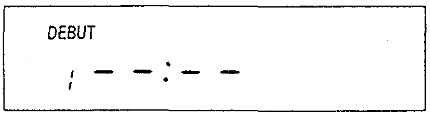
1. Appuyer sur la touche AUTO. ① du magnétoscope. Le mode de minuterie est annulé.
2. Appuyer sur la touche PROG. ② de la télécommande pour choisir le numéro du programme à modifier.
3. Changer la procédure d'enregistrement déclenché par minuterie .
4. Appuyer de nouveau sur la touche AUTO. ①.

POUR ANNULER LE PROGRAMME DE LA MINUTERIE

1. Appuyer sur la touche AUTO. ① du magnétoscope pour annuler le mode de minuterie.
   - Si l'on règle la minuterie, ignorer cette étape.
2. Appuyer sur la touche PROG. ② pour choisir le numéro de programme de la minuterie à annuler.



3. Appuyer sur la touche ANNUL ③ de la télécommande. Les moments de marche et d'arrêt de la minuterie sont annulés.



POUR VERIFIER LA PROGRAMMATION DE LA MINUTERIE

Appuyer à plusieurs reprises sur la touche PROG. ②. Chaque poussée sur cette touche fait apparaître les numéros des programmes 1 à 8, dans l'ordre.

CHEVAUCHEMENT DE PROGRAMMATIONS

Veiller à ne pas faire chevaucher des programmations de la minuterie. Si le cas se produit, la priorité d'exécution s'effectue de la manière suivante:

- Le programme en cours de visionnage est prioritaire.
- Si les moments de marche et d'arrêt sont identiques, le programme au numéro inférieur est prioritaire.

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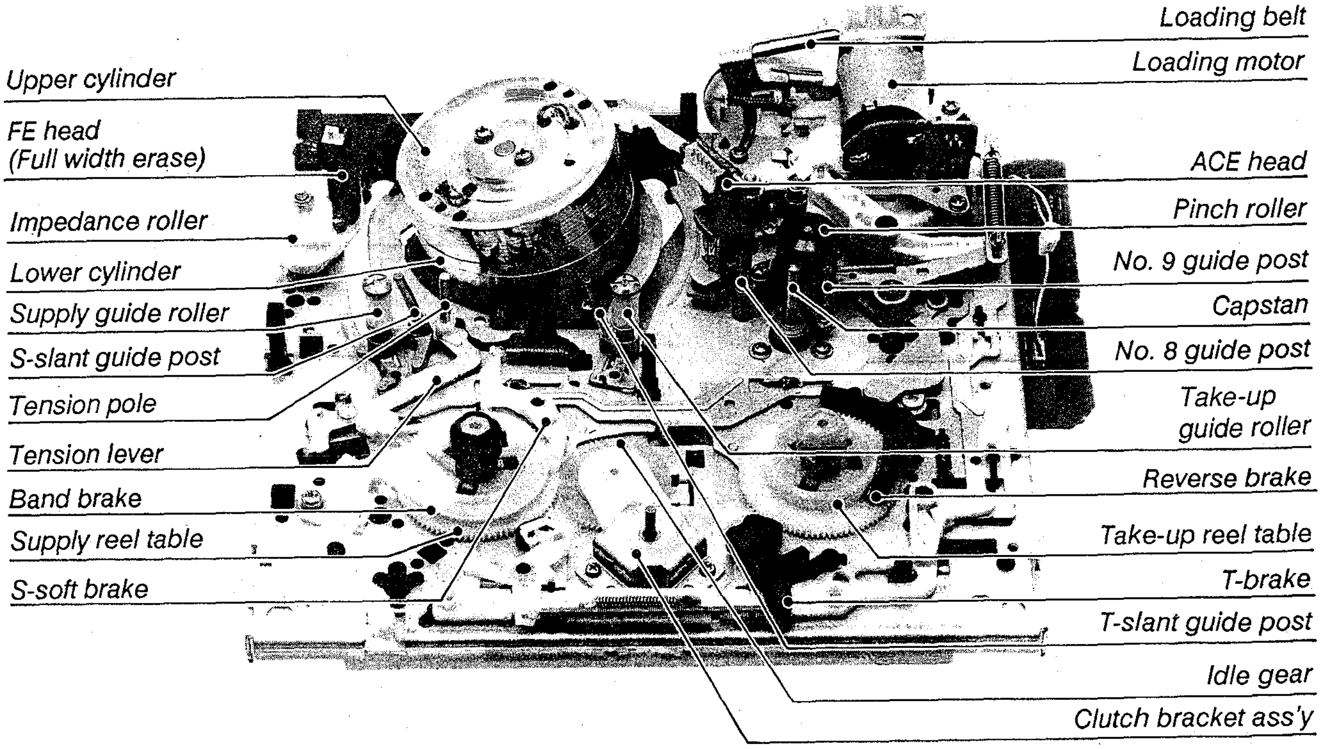
SECTION 2
ADJUSTMENT PROCEDURES

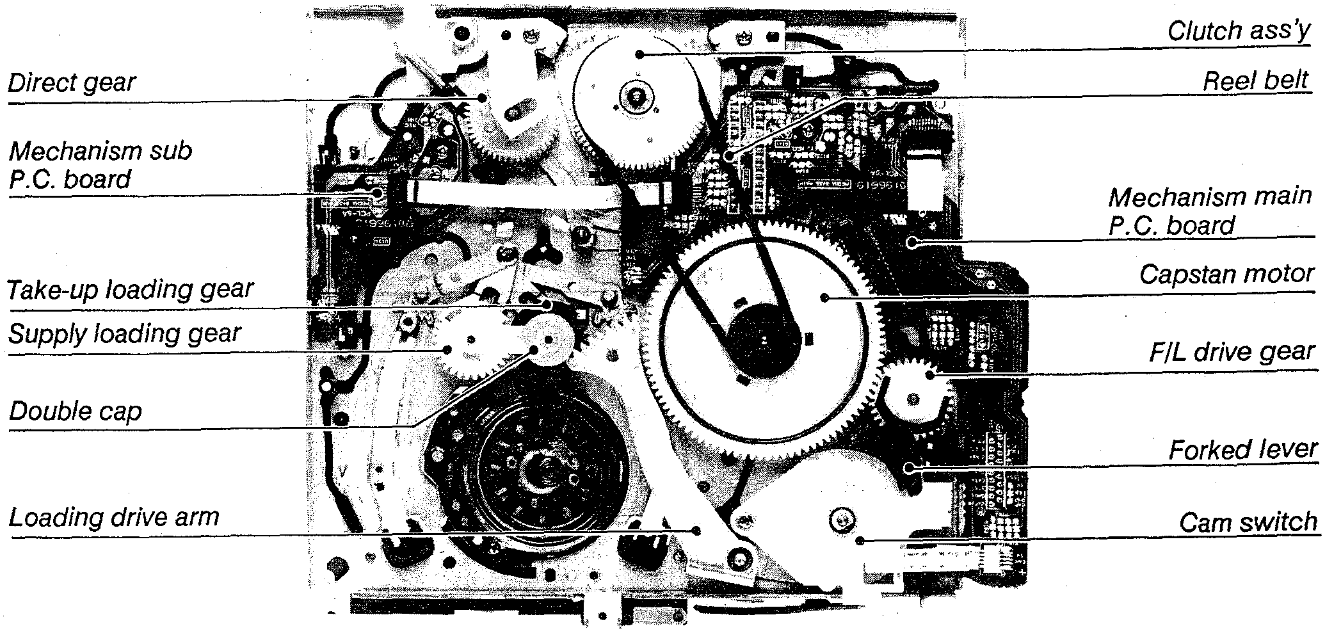
1. MECHANICAL ADJUSTMENT

1-1. Mechanical Parts Location

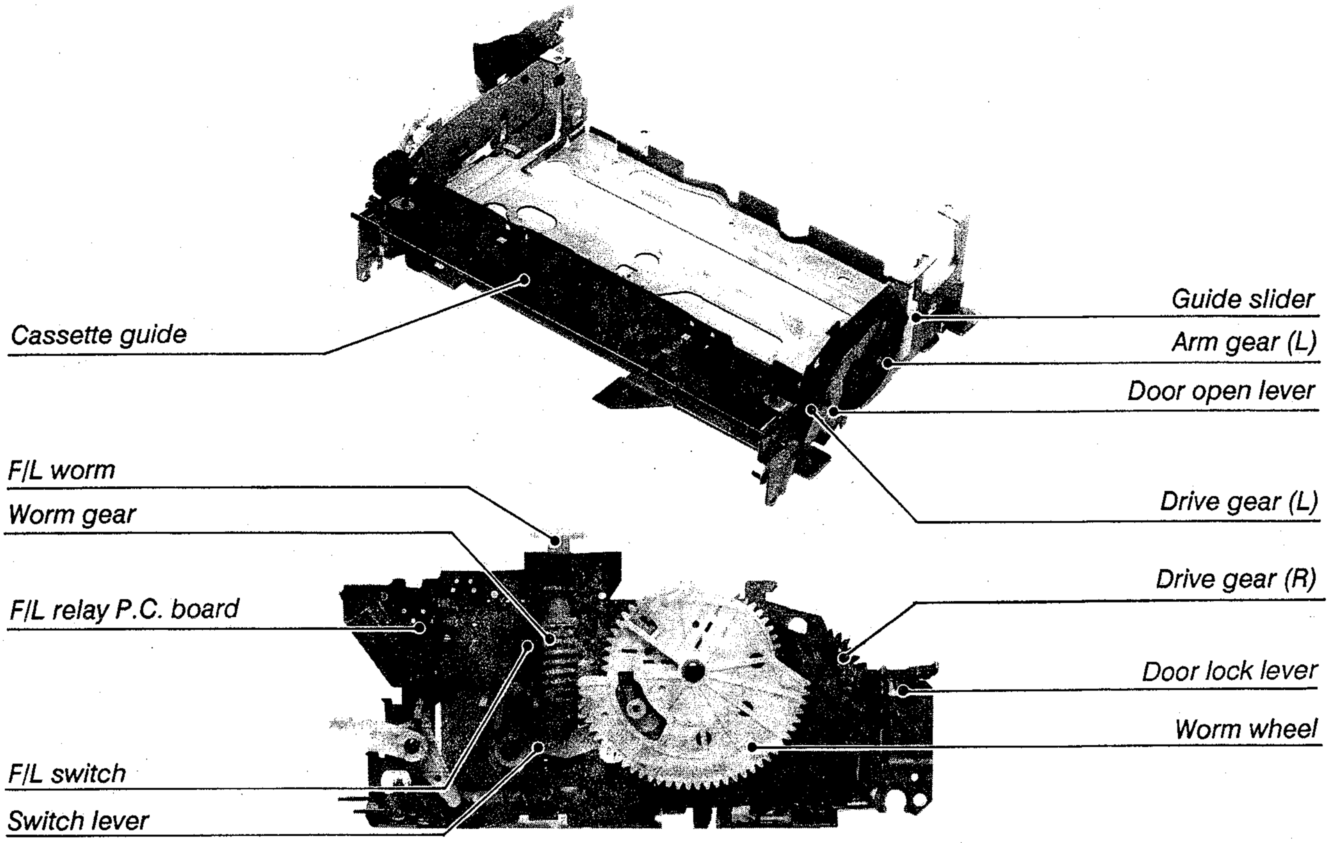
1-1-1. Top View


Upper cylinder
FE head (Full width erase)
Impedance roller
Lower cylinder
Supply guide roller
S-slant guide post
Tension pole
Tension lever
Band brake
Supply reel table
S-soft brake
Loading belt
Loading motor
ACE head
Pinch roller
No. 9 guide post
Capstan
No. 8 guide post
Take-up guide roller
Reverse brake
Take-up reel table
T-brake
T-slant guide post
Idle gear
Clutch bracket ass'y

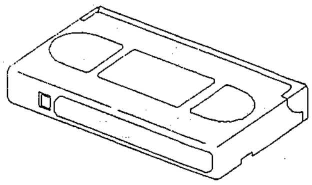
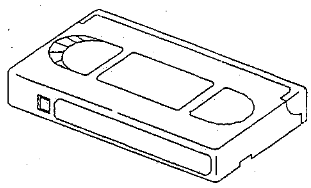
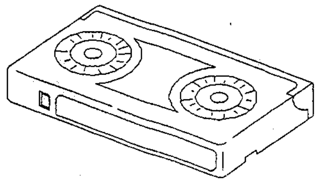
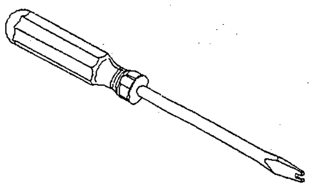
1-1-2. Bottom View


Direct gear
Mechanism sub P.C. board
Take-up loading gear
Supply loading gear
Double cap
Loading drive arm
Clutch ass'y
Reel belt
Mechanism main P.C. board
Capstan motor
F/L drive gear
Forked lever
Cam switch

1-1-3. Front Loading Mechanism


Cassette guide
Guide slider
Arm gear (L)
Door open lever
Drive gear (L)
F/L worm
Worm gear
F/L relay P.C. board
Drive gear (R)
Door lock lever
Worm wheel
F/L switch
Switch lever

1-2. Servicing Jig List

Alignment tape  ST-C4: 70909302	**Back tension cassette gauge**  70909103	**Torque cassette gauge (KT-300NR)**  70909199
Taper nut driver  70909228		

1-3. Main Parts Servicing Time

- Part replacement time differs from serving life time of each part.
- Following table is prepared based on a standard condition (room temperature, room humidity). The replacement time will be varied depending upon operation environment, using methods, operation duty, etc.
- Particularly, life of the upper cylinder depends upon operation conditions.

	Part Name	Servicing Time (Operating Hours)										Note
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape Transport System	Tension pole	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	• When cleaning, use a swab or a piece of gauze soaked in alcohol. • After the cleaning, cleaned parts are dried completely, and then load a video cassette. • When lubricating, always use the specified oil. • When lubricating, apply one or two drops of oil after the cleaning with alcohol.
	S-slant guide post											
	S-guide roller											
	Impedance roller											
	No. 8 guide post											
	Capstan											
	No. 9 guide post											
	Guide roller											
	T-slant guide post											
	Upper cylinder	Δ	O	Δ	O	Δ	O	Δ	O	Δ	O	
	FE head	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	O	
	ACE head	Δ	Δ	Δ	Δ	Δ	O	Δ	Δ	Δ	Δ	
	Pinch roller	Δ	Δ	Δ	Δ	Δ	O	Δ	Δ	Δ	Δ	
Tape Drive System	Capstan motor						O				O	
	Reel belt		Δ		O		Δ		O		Δ	
	Loading motor										O	
	Loading belt		Δ		O		Δ		O		Δ	
	Supply reel table				▲				▲		O	
	Take up reel table				▲				▲		O	
	Idle gear assembly		O		O		O		O		O	
Others	Band brake assembly		O		O		O		O		O	• Check the back tension.

Δ : Cleaning ▲ : Lubrication O : Check and replace if necessary

1-4. Main Parts Replacement

1-4-1. Front Loading Assembly Replacement

(1) Front loading assembly replacement

< Replacement >

1. Remove the top cover, front panel, and the bottom plate.
2. Remove the FL belt from rear bottom of the unit.
3. Disconnect the connector (A) from the F/L-R P.C. board.
4. Remove two screws (A).
5. Move the front loading assembly in direction shown by the arrow and remove it from the mechanism deck.
6. When remounting, use the above steps in reverse order.

Note:

When reinstalling the FL belt, take care the belt is not twisted.

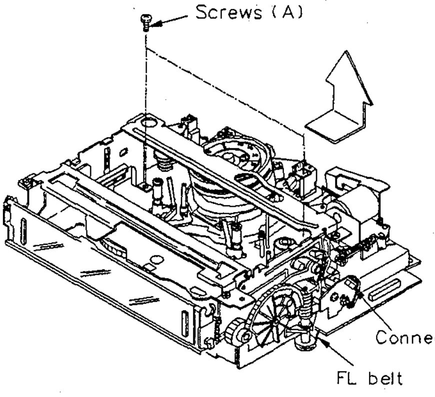


Fig. 4-1-1 Front loading assembly replacement

(2) F/L switch and photo-transistor replacement

1. Remove the screw (B) and the F/L-R P.C. board.
2. To remove the F/L switch and photo-transistor, unsolder the leads.
3. Replace them with new ones.

Note:

When reinstalling the F/L-R P.C. board, take care the F/L switch is not damaged.

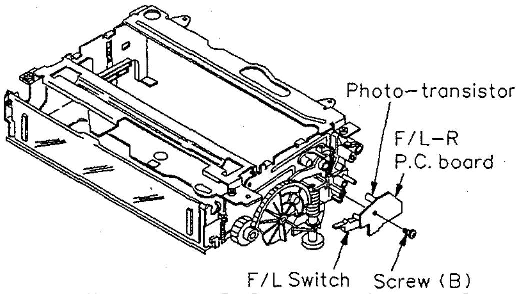


Fig. 4-1-2 F/L switch and photo transistor replacement

(3) Guide slider replacement

1. Turn the FL worm gear with your hand until the cassette holder is set to the cassette in condition.
2. Move the holder guide L outward and remove the guide slider from the cassette holder. Then, remove the guide slider from the holder guide L.
3. When remounting, use above steps in reverse order.
4. Turn the FL worm gear with your hand and set the cassette holder to the cassette out condition.

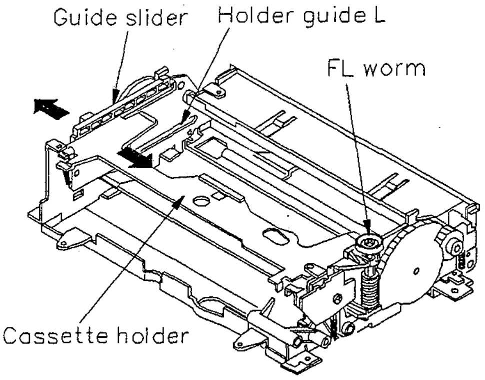


Fig. 4-1-3 Guide slider replacement

(4) Replacement of other parts

1. Do not replace the components not authorized. (Refer to the Parts List.)
   If replaced, accuracy of the front loading assembly will decrease and smooth operation may be not obtained.
2. When replacing the arm gear and the drive gear, take care on the following points:
   a: Position the arm gear and the drive gear so that their alignment marks match with the arm gear facing almost upward as shown in the illustration, and then mount them. This is true for both the left and right sides.
   b: If the alignment marks are not matched, the front loading may not operate smoothly.

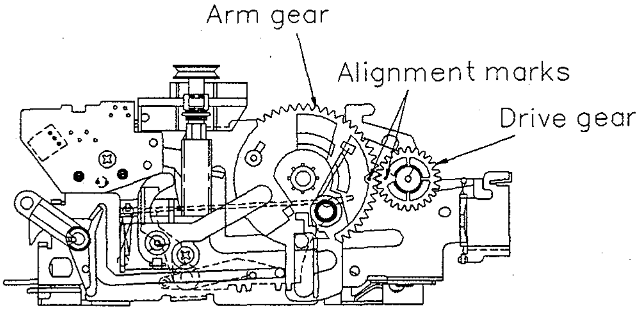


Fig. 4-1-4

1-4-2. Cylinder

(1) Upper cylinder assembly

< Inspection >

1. Check if the video heads are damaged or worn out.
2. Check video heads for clogging (Replace the upper cylinder assembly if the clogging is not remedied after cleaning).

< Replacement >

1. Remove the upper cylinder assembly according to the replacement procedures.
2. Remove the relay lead wire soldered on the head relay terminal.
3. Remove two screws and remove the upper cylinder assembly.
   Note:
   If the upper cylinder assembly is tightly mounted on the shaft and not removed, soak engaged part of the upper shaft in alcohol and then pull out the upper cylinder assembly from the shaft.
   Do not remove the cylinder assembly with excessive force applied.
4. Clean the new upper cylinder assembly, the surface of the flange and shaft using the cleaning kit.
5. Paint around the shaft engagement part with a oil type felt-pen for once.
   Note:
   If paint more than two times around the engagement part, the space between the shaft and the upper cylinder assembly becomes too small to mount the upper cylinder assembly.
6. After confirming the paint being dried sufficiently, mount the new upper cylinder assembly.
   First, position the rotary transformer relay wire leads vertically along the flange and thread them into the wire hole, and then mount the upper cylinder assembly onto the shaft.
   Note:
   In this case, do not mistake wire threading hole so that the same color leads of the relay terminal and the relay wire leads can be soldered each other.
   Relay terminal (Red):
   Relay wire leads (Red, Blue)
   Relay terminal (Brown):
   Relay wire leads (Brown, Blue)
7. Solder the head relay terminal and the relay wire lead after mounting the upper cylinder assembly with screws.
8. Perform the tape transport adjustment according to the previous steps in reverse order.

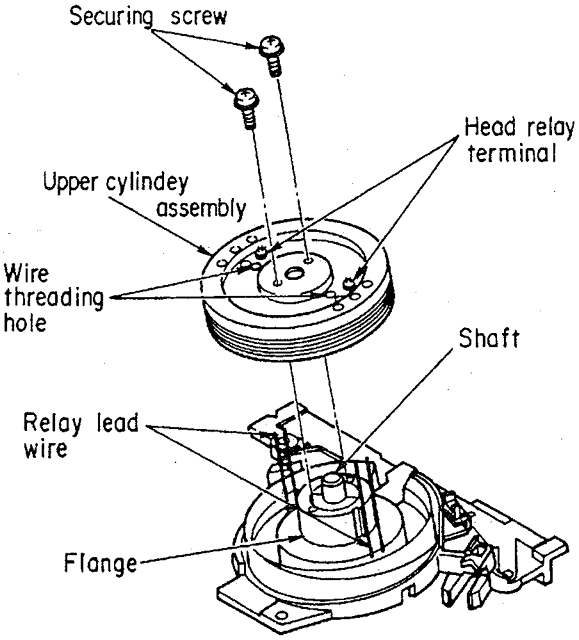


Fig. 4-2-1

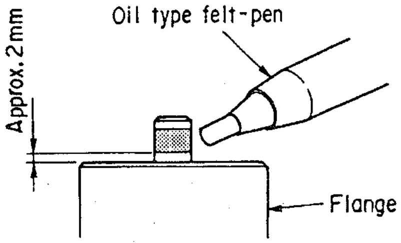


Fig. 4-2-2

(2) Cylinder Assembly

< Inspection >

1. Check if rotating surface of the lower cylinder has no damages such as scratches, cracks, etc.
2. Check to see smooth rotation of the upper cylinder. If abnormality is found, replace the cylinder(s).

< Replacement >

1. Remove the preamplifier harness from the set side and remove the motor harness from the cylinder side.
2. Remove three cylinder securing screws (A).
3. Remove the cylinder assembly with preamplifier.
   Note:
   Remove the full width erase head while pushing it to the arrow direction.
4. Remove two preamplifier securing screws (B) and remove the preamplifier from the R.T. P.C. board.
5. Mount a new cylinder assembly using the previous steps in reverse order, taking care not to touch the video heads directly and not to damage the cylinder surface.
6. Perform the tape transport adjustment.

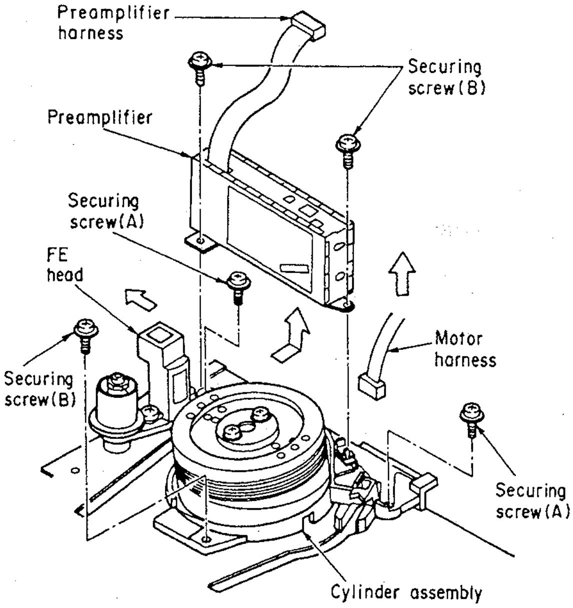

Preamplifier harness
Securing screw(B)
Preamplifier
Securing screw(A)
FE head
Motor harness
Securing screw(B)
Securing screw(A)
Cylinder assembly

Fig. 4-2-3

1-4-3. Transport System Parts Replacement

(1) ACE head assembly replacement

1. Disconnect the connector from the ACE P.C. board.
2. Remove the taper nut.
3. Remove the pinch lock spring and pinch connector so that they do not give trouble when removing the pinch roller from the ACE head.
4. Turn the ACE height adjusting nut counterclockwise and remove the nut in order to remove ACE base assembly. (Fig. 4-3-1)

Note:
Note positions of the ACE base and the taper nut.

5. Remove the E-ring and the ACE azimuth adjusting screw in order to remove the ACE head assembly.
6. Remove the ACE P.C. board from the ACE head assembly.
7. Replace the ACE head assembly, according to the reverse procedures.
8. Mount the taper nut, pinch lock spring and pinch connector.
9. Rotate the ACE height adjusting nut until the ACE base and the upper position of the taper nut have the same position as they were removed.
10. After mounting, perform the tape transport adjustment, starting from the first step.

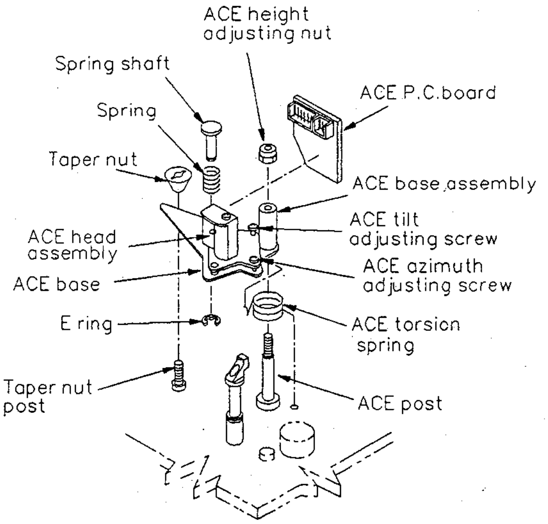

ACE height adjusting nut
Spring shaft
Spring
ACE P.C.board
Taper nut
ACE base assembly
ACE tilt adjusting screw
ACE head assembly
ACE azimuth adjusting screw
ACE base
E ring
ACE torsion spring
Taper nut post
ACE post

Fig. 4-3-1 Replacement of ACE head assembly

Note:

- Since direct mounting of the ACE torsion spring is difficult, first insert the tip of the spring into the hole on the main base and then hook the opposite tip of the spring to the ACE base which has been inserted into the ACE post.
- When replacing the ACE head assembly, always use an ACE head having the same part number. Do not use any other ACE head assembly.

(2) No. 8 guide sleeve replacement

1. Remove No. 8 cap and No. 8 guide sleeve in this sequence as shown in Fig. 4-3-2. When reassembling, perform the previous steps in reverse order.
2. To mount the No. 8 guide sleeve, insert the No. 8 cap onto the No. 8 post and push the cap downward while turning the cap left and right.

Note:

- No. 8 guide sleeve functions as the reference for tape transport, so the replacement should be made carefully.
- When mounting the No. 8 guide cap, mount the cap with its slant surface facing to cassette side.
- The guide sleeve has a directional characteristic, so take care when inserting it. Do not insert the sleeve upside-down. The lower flange thickness is higher than the upper flange thickness by about 1.6mm.

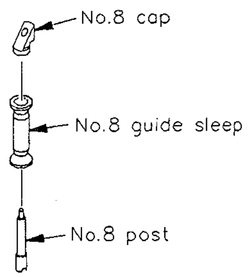

No.8 cap
No.8 guide sleep
No.8 post

Fig. 4-3-2 No. 8 guide replacement

(3) FE head replacement

1. Disconnect the 2P connector of the FE head.
2. Remove the FE head mounting screw and the FE head can be removed. (Fig. 4-3-3)
3. Replace the new FE head and tighten the FE head mounting screw.
4. Connect the 2P connector.
5. Confirm whether the associated adjustments is not upset, starting check from the linearity adjustment, item 4) of the tape transport adjustment. (Refer to item 1-5-4 (3).)

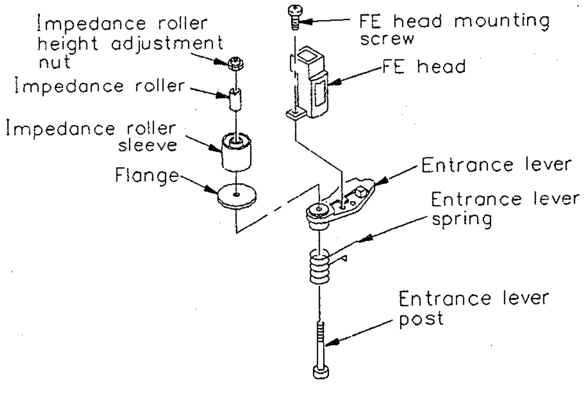

Impedance roller height adjustment nut
Impedance roller
Impedance roller sleeve
Flange
FE head mounting screw
FE head
Entrance lever
Entrance lever spring
Entrance lever post

Fig. 4-3-3 Replacement of No. 3 guide and FE head

(4) Impedance roller replacement

1. Remove the impedance roller height adjusting nut and replace the impedance roller as shown in Fig. 4-3-3. Before removing the nut, note the number of threads or height exceeding the surface of the nut.
2. When mounting a new impedance roller, use the reverse procedures.
3. After replacement of the impedance roller, perform the adjustment from the linearity adjustment, item 4) in the tape transport adjustment. (Refer to item 1-5-4 (3).)

(5) S, T-guide rollers replacement

The same replacement procedures will be applied for both S and T-guide rollers.

1. Loosen the set screw shown in Fig. 4-3-4.
2. Turn the guide roller counterclockwise and remove it.
3. As the O-ring may stick to the guide roller when removed, remove the O-ring and install it on the new guide roller.
4. When remounting, perform the previous steps in reverse order.
5. After completion of the replacement, perform adjustment from the linearity adjustment item 4) in the tape transport adjustment. (Refer to item 1-4-5 (3).)

Note:

When tightening the set screw, temporarily tighten it with light pressure. If it is tightened too hard, associated adjustments can not be made.
The S-guide roller has a no mark on the upper flange and the T-guide roller has a black mark on upper flange. Do not exchange them when remounting.

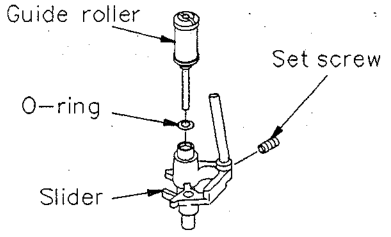


Fig. 4-3-4 Guide roller replacement

(6) S, T-sliders replacement

1. Remove the cylinder assembly.
2. Place the VTR vertically and remove the bottom cover.

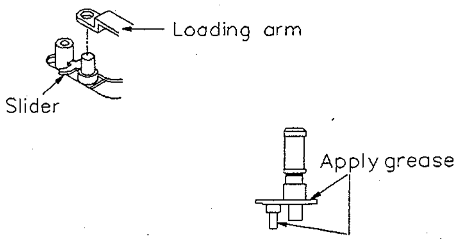


Fig. 4-3-5 S, T-slider replacement

3. Move the slider up to the loading position by turning the loading motor with your hand.
4. Remove the loading arm as shown in Fig. 4-3-5.
5. Remove the guide roller and reinstall it in a new slider according to the steps stated in (5).
6. When replacing the slider, perform the previous steps in reverse order.
7. After completion of the replacement, perform the rough adjustment in the tape transport system adjustment. (Refer to item 1-5-4 (3)).

Note:

When the slider is replaced, always apply grease to the slider receptacle as shown in Fig. 4-3-5.

(7) No. 9 guide lever assembly replacement

1. Remove the front loading assembly.
2. Remove the pinch lever assembly.
3. Remove the cam lever assembly.
4. Remove the loading drive assembly.
5. Remove the ACE head assembly.
6. Remove the nut and replace the No. 9 guide lever. In this case, note the number of threads exceeding the surface of the nut.
7. Reassemble the parts removed, using the reverse procedures.
   (Tighten the nut until the same thread number appears.)
8. After completion of the replacement, perform the adjustment from item 6) in the tape transport adjustment. (Refer to item 1-5-4 (3).)

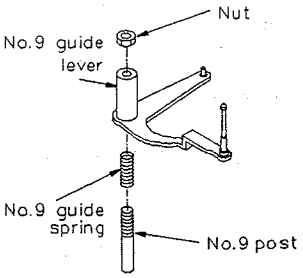


Fig. 4-3-6 No 9 guide lever replacement

1-4-4. Pinch Roller Assembly Replacement

1. Remove the pinch lock spring and disconnect the pinch connector.
2. Remove the stop ring and remove the pinch roller assembly upward.
3. Clean the pinch post and apply grease on it.
4. Replace the pinch roller assembly according to the previous steps in reverse order.
5. After replacement, make sure the T-sub brake is in touch with the T-reel table with a proper pressure.
6. After completion of the replacement, perform adjustment from item "1-5-4 (3) Tape transport system adjustment".

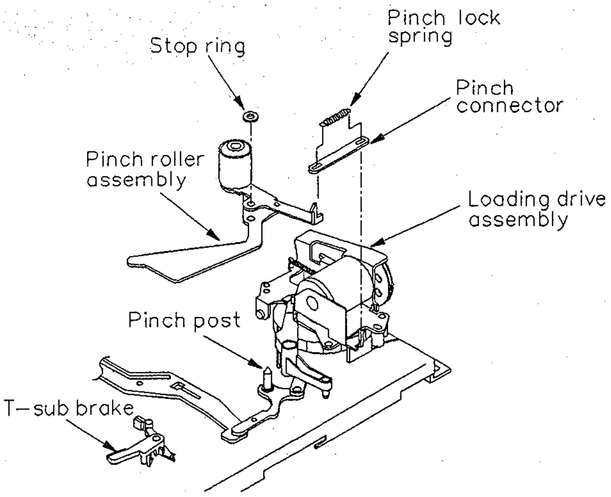

Pinch lock spring
Stop ring
Pinch connector
Pinch roller assembly
Loading drive assembly
Pinch post
T–sub brake

Fig. 4-4-1 Pinch roller replacement

1-4-5. Loading Motor Replacement

1. Remove the motor P.C. board from the loading motor, taking care not to damage the wire harness.
2. Remove the pinch lock spring and disconnect the pinch connector.
3. Off-hook the claw hooked on the main base, using a screw driver and remove the cam lever upward.
4. Remove the screws (A) and remove the loading drive assembly.
5. Remove the loading belt and screws (B), and remove the motor.
6. When replacing the motor with a new one, perform the previous steps in the reverse order, taking care of the polarities (+) polarity should be located on the bottom leftside. In this case, also mount the dew sensor with the motor, using the screws (B). Do not touch the surface of the sensor.

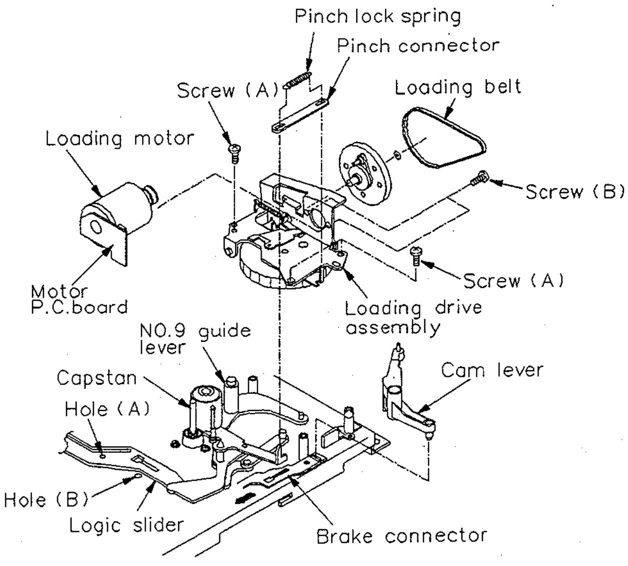

Pinch lock spring
Pinch connector
Screw (A)
Loading belt
Loading motor
Screw (B)
Screw (A)
Motor P.C.board
Loading drive assembly
NO.9 guide lever
Cam lever
Capstan
Hole (A)
Hole (B)
Logic slider
Brake connector

Fig. 4-5-1 Loading motor replacement

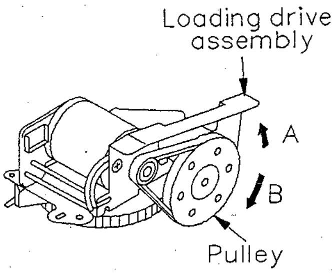

Loading drive assembly
A
B
Pulley

Fig. 4-5-2 Loading drive mounting mode

7. Turn the pulley of the loading drive assembly counterclockwise (as arrow A) until it stops, and then rotate it 3 turns clockwise (as arrow B) to set the mounting mode.
8. Before mounting the loading drive assembly on the main base, position the logic slider so that its hole matches the phase matching hole (A), and then move the No. 9 guide lever until it touches the capstan.
   As the phase matching hole (A) exists near the hole (B) (1.2cm right from hole (A)), do not mistake hole (B) for hole (A).
9. Slide the brake connector in the direction shown by the arrow, and mount the cam lever.
10. Mount the pinch connector and the pinch lock spring.

1-4-6. Tension Regulator Assembly

1. Remove the tape tension spring from the tension regulator assembly.
2. Remove the screw and remove the tension regulator assembly from the main base while releasing the S-soft brake lever.
3. Clean the shaft of the new tension regulator and then apply one or two drops of oil. When replacing the tension regulator, perform the previous steps in reverse order.
4. After completion of the replacement, check position of the tension pole and its adjustment (refer to item 1-5-2) and check the back tension (refer to item 1-5-3).

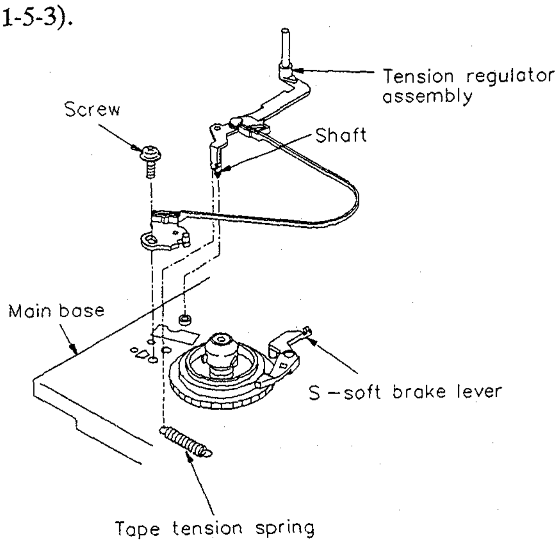

Tension regulator assembly
Screw
Shaft
Main base
S –soft brake lever
Tape tension spring

Fig. 4-6-1 Tension regulator assembly replacement

1-4-7. Cam Switch Replacement

1. Remove the screw and the cam switch assembly.
2. Apply grease to the boss section (lower than the cutout D) of the loading cam.
3. Position the cam switch assembly so that the hole (D) on the cam switch matches the cutout D on the loading cam, and then mount the cam switch with the screw.

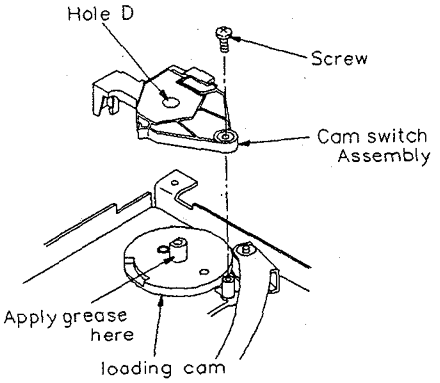

Hole D
Screw
Cam switch Assembly
Apply grease here
loading cam

Fig. 4-7-1 Cam switch assembly replacement

1-4-8. T, S-Sensor Assemblies Replacement

1. Remove the mechanism main or sub P.C. board.
2. Desolder four sensor leads.
3. Unhook the holder claws from the P.C. board.
4. When reinstalling a new sensor, perform the previous steps in the reverse order.

Note:

Since the Hall element is glued on the sensor holder, take care the hall element is not torn off during installation.

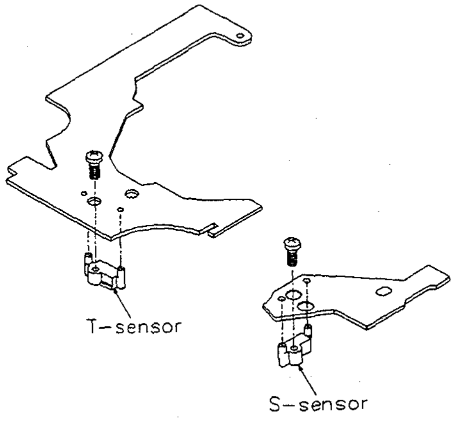

T–sensor
S–sensor

Fig. 4-8-1 Sensor assemblies replacement

1-4-9. Main Brake Assembly Replacement

1. The brake assembly has the mold claws which allow one touch installation or removal.

Note:

When replacing, take care not to touch the brake pad surface.

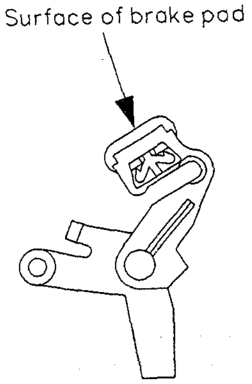

Surface of brake pad

Fig. 4-9-1 Main brake assembly replacement

1-4-11. Reel Table Replacement

(1) Supply reel table assembly

1. Remove the tape tension spring from the tension regulator assembly. (Also remove the mechanism sub P.C. board.)
2. Remove the screw and remove the tension regulator assembly.
3. Remove the S-reel table assembly upward paying attention not to miss the washer while releasing the S-soft brake lever in the direction shown by the arrow.
4. After cleaning the reel shaft with a cleaning kit, lubricate it with one or two drops of oil.
5. When reinstalling the S-reel table assembly to the deck, make sure the washer is replaced on the reel shaft.
6. Mount the tension regulator assembly.
7. Hook the tape tension spring onto the tension regulator assembly.

Note:
In this case, take care not to give permanent deformation to the spring.

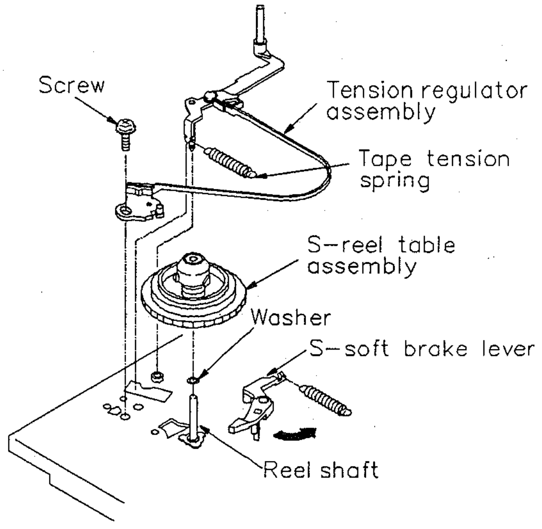

Screw
Tension regulator assembly
Tape tension spring
S-reel table assembly
Washer
S-soft brake lever
Reel shaft

Fig. 4-11-1 Supply reel table assembly replacement

(2) Take-up reel table assembly

1. Remove the pinch lock spring.
2. Remove the pinch connector.
3. Remove the pinch roller assembly.
4. Remove the reverse brake spring from the reverse brake assembly.
5. Remove the reverse brake assembly from the main base. In this case, move the reverse brake in the direction shown by the arrow to remove the brake assembly at a larger hole of the main base.
6. Remove the T-reel assembly.
7. As the bearing is stained with oil, the washer may stick to the T-reel table assembly and be removed with it. Take care not to miss them.
8. Clean the reel shaft using a cleaning kit, and apply one or two drops of oil after the reel shaft has dried.
9. Replace the take-up reel with a new one.

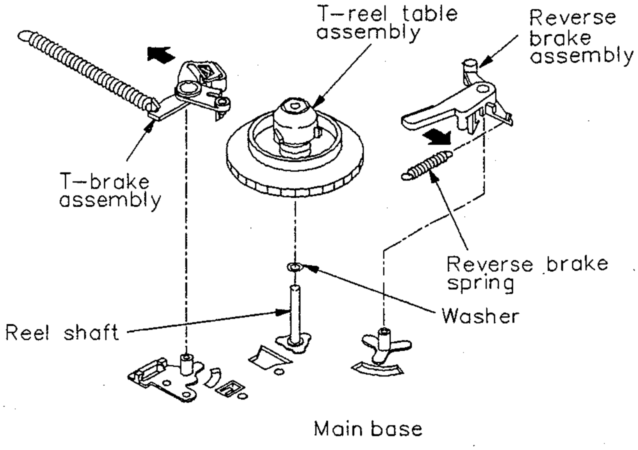

T-reel table assembly
Reverse brake assembly
T-brake assembly
Reverse brake spring
Washer
Reel shaft
Main base

Fig. 4-11-2 Take-up reel table assembly replacement

1-4-12. Direct Gear Assembly Replacement

1. Turn the deck upside-down and remove the reel belt.
2. Remove the flat cable (FFC) and the main relay P.C. board. (Refer to item 1-4-15 (1).)
3. Remove the gear lever spring.
4. Remove the stop ring (1) and remove the gear lever upward.
5. Remove the stop ring (2), and remove the direct gear assembly from the gear lever, taking care not to miss the washers.

6. Clean the gear post, using the cleaning kit. Apply one or two drops of oil.
7. When replacing the direct gear assembly and mounting the gear lever, make sure the washers are replaced on the gear post.
8. Apply grease to the lever post and then mount it in the reverse order.

Note:

- When inserting the stop ring (2), hold the under side of the gear post.
- When installing the gear lever spring, take care of the direction of the hook.
- Take care that the gear lever spring is not positioned over the release lever.
- Take care that the gear lever spring is not positioned over the drive base stopper.

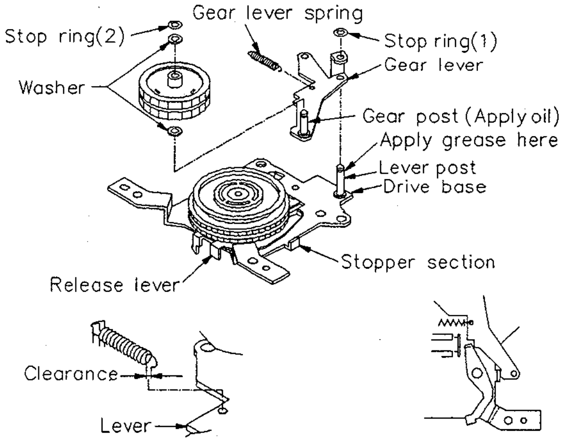

Gear lever spring
Stop ring(2)
Stop ring(1)
Gear lever
Washer
Gear post (Apply oil)
Apply grease here
Lever post
Drive base
Stopper section
Release lever
Clearance
Lever

Fig. 4-12-1 Direct gear assembly replacement

1-4-13. Clutch Assembly Replacement

1. Turn the deck upside-down and remove the reel belt.
2. Remove the stop ring, and remove the clutch assembly upward. Take care not to miss the washers.
3. Clean the clutch post using the cleaning kit, and then apply one or two drops of oil.

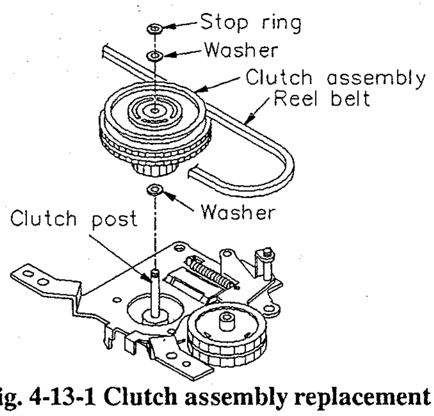

Stop ring
Washer
Clutch assembly
Reel belt
Clutch post
Washer

Fig. 4-13-1 Clutch assembly replacement

4. When replacing the clutch assembly and mounting it on the deck, make sure the washers are replaced on the clutch post.
5. When remounting, use the reverse procedures. (When mounting the belt, take care that the belt is not twisted.)
6. Check the reel torque, using the torque cassette.

1-4-14. Idle Gear Assembly Replacement

1. Turn the deck upside-down.
2. Remove the clutch as stated in item "1-4-13. Clutch Assembly Replacement".
3. Remove the direct gear assembly from the gear lever as stated in item "1-4-12. Direct Gear Assembly Replacement".
4. Place the deck in normal position.
5. Remove two screws.
6. Replace the idle gear assembly with a new one, using the reverse procedures. In this case, assemble the idle gear assembly with the shaft space (between the clutch post and gear post) set as $33.2^{+0.1}_{-0.15}$ mm . (When mounting the belt, take care that the belt is not twisted.)
7. Check the reel torque, using the torque cassette.

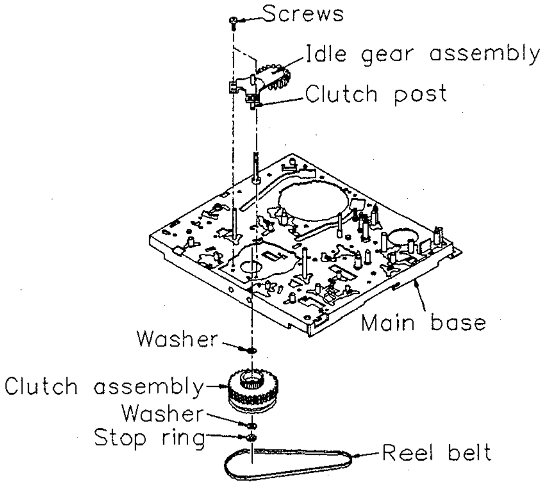
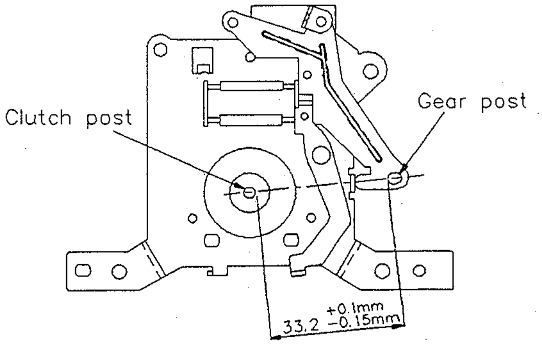

Screws
Idle gear assembly
Clutch post
Main base
Washer
Clutch assembly
Washer
Stop ring
Reel belt

Fig. 4-14-1 Idle gear assembly replacement


Clutch post
Gear post
+0.1mm
33.2 -0.15mm

(Use slide calipers.)

Fig. 4-14-2

1-4-15. Mechanism Relay P.C. Board Replacement

(1) Mechanism main P.C. board replacement

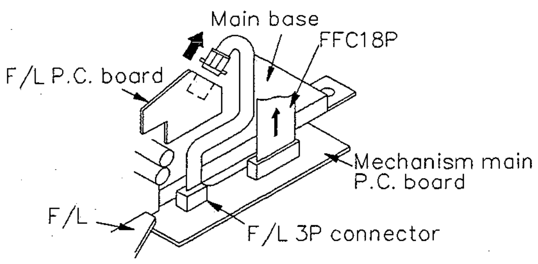

Main base
FFC18P
F/L P.C. board
Mechanism main P.C. board
F/L
F/L 3P connector

Fig. 4-15-1 Main P.C. board replacement

1. Pull and disconnect the FFC18P connector in direction shown by the arrow from the mechanism main P.C. board. Next disconnect FL3P connector from the F/L P.C. board of by pulling it in direction shown by the arrow.
2. Disconnect FFC5P from the mechanism assembly, rear side by pulling it in direction shown by the arrow. Next, remove the F/L belt and the reel belt. (Fig. 4-15-3)

Note:
The F/L belt and the reel belt are different in their length, so paying attention when replacing them.

3. When disconnecting the FFC6P and the FFC10P, refer to the disconnecting method shown in Fig. 4-15-2.

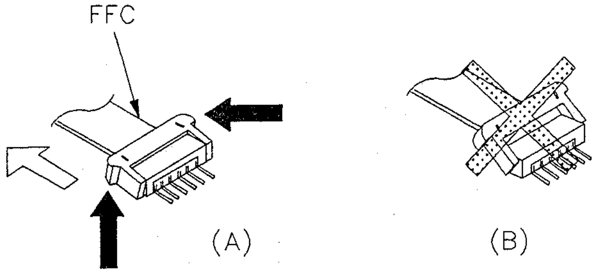


Fig. 4-15-2

< How to disconnect the flat cable from the FFC connector locked >
Hold the protruded parts (shown by the black arrows) of the connector and pull the connector in the direction shown by the white arrow to release the lock. Then, pull the FCC (flat cable) and the cable will be removed. Don't pull the connector as shown in Fig. 4-15-2 (B). If pulled strongly in the direction to be opened, the cable will be damaged.
When connecting, insert the cable with the metal terminal side facing down and then use previous steps in reverse order.

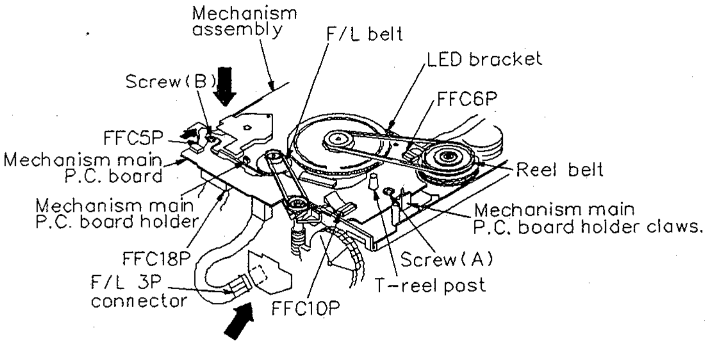

Mechanism assembly
F/L belt
LED bracket
Screw(B)
FFC6P
FFC5P
Mechanism main P.C. board
Reel belt
Mechanism main P.C. board holder
Mechanism main P.C. board holder claws.
FFC18P
Screw(A)
F/L 3P connector
T-reel post
FFC10P

Fig. 4-15-3

4. Remove screw (A) and screw (B). (Since the screws are different each other, paying attention when replacing them.)
5. Press and bend claws of the LED bracket in direction shown by the black arrows on upper side of the mechanism assembly, and then push them in direction shown by the white arrow so that they can pass the hole (Fig. 4-15-4).

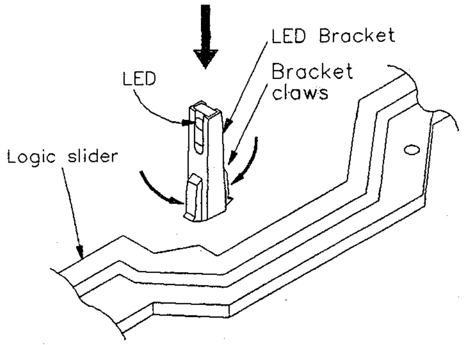

LED Bracket
LED
Bracket claws
Logic slider

Fig. 4-15-4

6. Unhook the mechanism main P.C. board from the mechanism main P.C. board holding claws on the front mechanism assembly and lift the mechanism main P.C. board slightly. (Fig. 4-15-5 and 4-15-6)
7. Turn the mechanism main P.C. board in the direction shown by the shaded arrow as shown in Fig. 4-15-5, and remove the P.C. board from the mechanism main P.C. board holder section. In this case, the P.C. board will close to the F/L worm bracket, so slightly lift the P.C. board so that the P.C. board does not touch the worm bracket. Also take care not to damage the main P.C. board holder. Finally, remove the mechanism main P.C. board, paying attention not to touch the reel post.

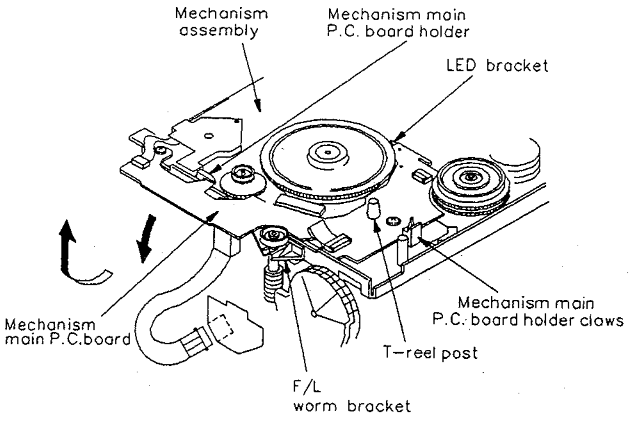

Mechanism assembly
Mechanism main P.C. board holder
LED bracket
Mechanism main P.C.board
Mechanism main P.C. board holder claws
T-reel post
F/L worm bracket

Fig. 4-15-5

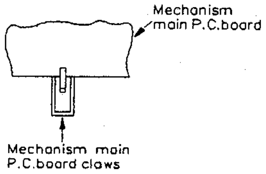

Mechanism main P.C.board
Mechanism main P.C.board claws

Fig. 4-15-6

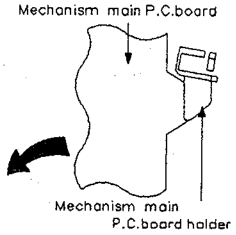

Mechanism main P.C.board
Mechanism main P.C.board holder

Fig. 4-15-7

Note:
When removing or remounting, take care that the LED is not contaminated by grease or damaged by scratches. (Fig. 4-15-4)

8. When mounting, insert the LED section onto the LED bracket hole so that the claws of the LED bracket do not engage the main base completely (Fig. 4-15-8). Next, mount the P.C. board on the T-reel post and the mechanism main P.C. board holder section securely, using the previous steps in reverse order. In this case, take care that FFC5P, FFC6P, and FFC10P are not jammed between the parts.
9. Hereafter, mount the parts in reverse procedures. In this case, route the FFC6P as shown in Fig. 4-15-9.

Note:
Take care the reel belt does not touch the flat cables, etc.
Also take care the reel belt and the F/L belt are not twisted when they are installed.

10. After the replacement, make sure all parts such as connectors, belts, etc. are mounted without missing any parts. Improper connection or installation, etc. may cause erroneous operation.

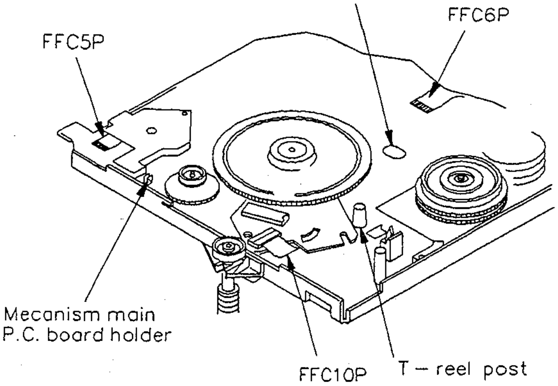

LED braket hole
FFC6P
FFC5P
Mecanism main P.C. board holder
FFC10P
T – reel post

Fig. 4-15-8

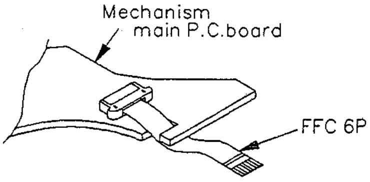

Mechanism main P.C.board
FFC 6P

Fig. 4-15-9

(2) Mechanism sub P.C. board replacement

1. Disconnect the flat cable (which connects the main and the sub P.C. board) from the connector on the sub P.C. board.
2. Remove the screw.
3. Remove the sub P.C. board while opening the claws securing the sub P.C. board. In this case, take care not to damage the lens of the end sensor mounted on rear of the sub P.C. board.
4. When mounting, use the reverse procedures. Mount the sub P.C. board while turning the erase prevention lever in the direction shown by the arrow.

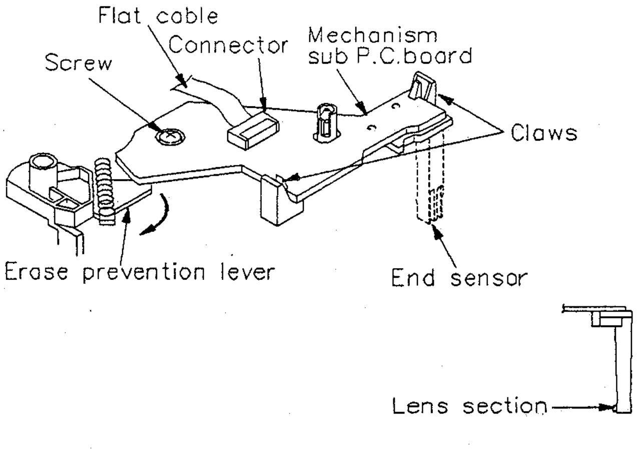

Flat cable
Connector
Screw
Mechanism sub P.C.board
Claws
Erase prevention lever
End sensor
Lens section

Fig. 4-15-10

1-4-16. Capstan Motor Replacement

1. Turn the deck upside-down.
   Remove the F/L belt, reel belt, FFC (3) for cam switch, FFC (4) for mechanism sub P.C. board, and FFC (5) for capstan motor.

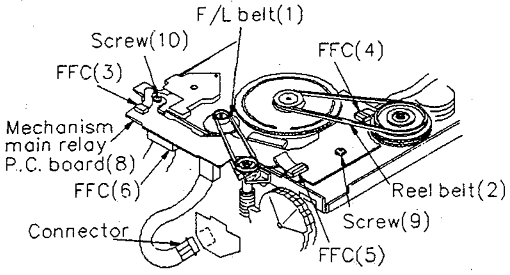

F/L belt(1)
Screw(10)
FFC(4)
FFC(3)
Mechanism main relay P.C. board(8)
FFC(6)
Reel belt(2)
Screw(9)
Connector
FFC(5)

Fig. 4-16-1

2. Replace the deck in normal position.
   Remove the FFC (6) for unit main P.C. board, and then disconnect the connector extending from the mechanism main relay P.C. board to the F/L.
3. Remove screws (9) and (10) from the rear of the deck, and remove the mechanism main relay P.C. board. (For more details, refer to item "1-4-15.) Mechanism Relay P.C. Board Replacement". (Screws (9) and (10) are not the same, so do not exchange when using.)
4. Remove the FFC (3) from the capstan motor by sliding the connector holder in the direction shown by the arrow.

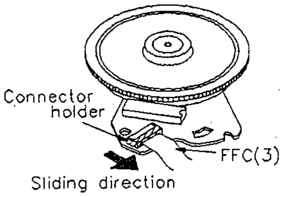

Connector holder
FFC(3)
Sliding direction

Fig. 4-16-2

5. Hold the capstan motor on the rear of the deck. Remove three screws on the front side of the deck and then remove the motor.

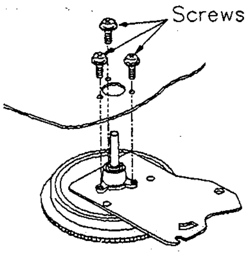


Fig. 4-16-3

6. Replace the capstan motor with a new one having the same part number.
7. First, position the capstan motor so that its direction matches to its receptacle as shown in the Fig. 4-16-4 and then mount the motor from the rear side of the deck, taking care not to damage the shaft, motor, etc. Particularly take care not to damage the F/L drive gear.

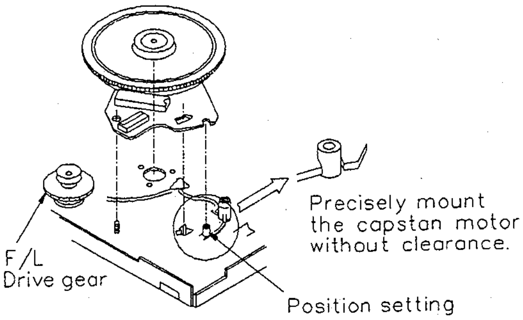

Precisely mount the capstan motor without clearance.
F/L Drive gear
Position setting

Fig. 4-16-4

8. Next, secure the capstan motor with three screws from the upper side of the deck. In this case, do not use the screws once removed. Precisely mount the motor without any clearance.

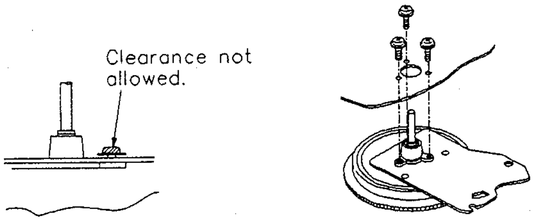

Clearance not allowed.

Fig. 4-16-5

9. Connect the FFC to the motor, taking care of its top and bottom side. It should be inserted with the metal terminal side facing downward. Insert the FFC and securely lock the connector by moving it as shown by the shaded arrow.

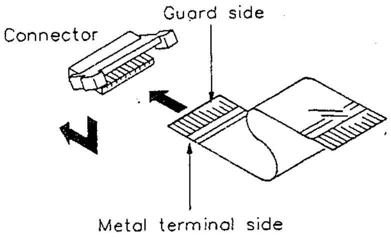

Guard side
Connector
Metal terminal side

Fig. 4-16-6

10. Hereafter, proceed the remounting, using the mounting procedures in the reverse order.
    When remounting, take care that the capstan motor, reel belt, FFC, etc. are not in contact with each other. Also take care that the belt is not twisted.
11. After completion of the capstan motor replacement, check the transport characteristics according to the transport adjustment procedure. (Refer to item 1-5-4 (3).)

1-5. Check and Adjustment

1-5-1. Phase Matching of Loading Gear

1. Turn the pulley of the loading drive assembly in a counterclockwise direction (viewed from the motor shaft) until it stops, to set the loading gear to the mounting position.
   (If the turning of the pulley is difficult, disconnect the connector from the motor P.C. board and apply a voltage of 7V to pins 1 and 2.)
2. Move the S, T-sliders and tension lever to the unloading positions.

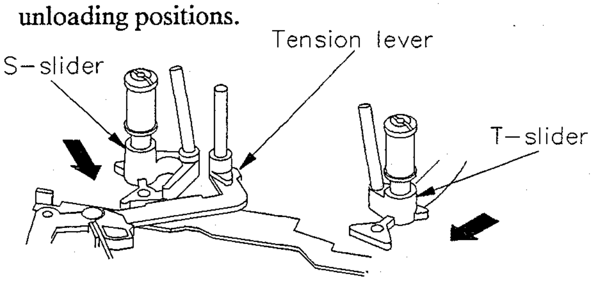

Tension lever
S-slider
T-slider

Fig. 5-1-1 Unloading position

3. Mount the T-loading gear and T-loading link assemblies on the boss provided at the T-slider (capstan side).
4. Align the two delta marks to fit the T-loading gear and S-loading gear, and then mount the S-loading gear and S-loading link assemblies.

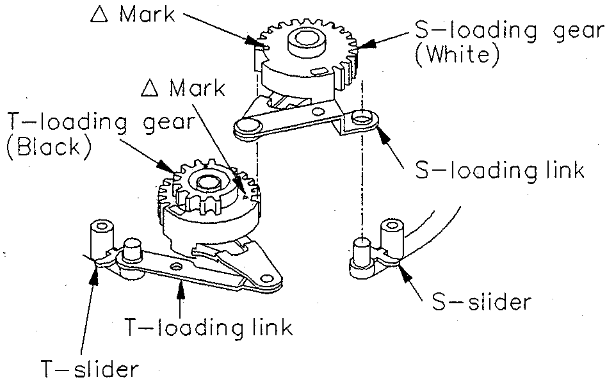

△ Mark
S-loading gear
(White)
△ Mark
T-loading gear
(Black)
S-loading link
S-slider
T-loading link
T-slider

Fig. 5-1-2 Loading gear mounting

5. Align the engraved mark of the loading arm and the circular hole of the T-loading gear, and then mount the loading arm.

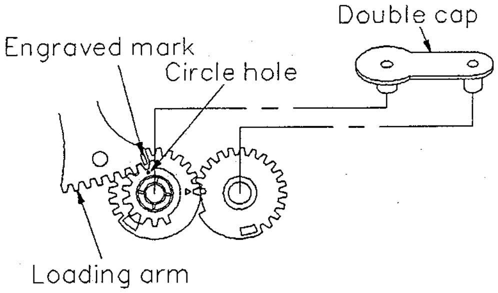

Double cap
Engraved mark
Circle hole
Loading arm

Fig. 5-1-3 Loading gear phase matching

6. Mount the double cap (larger side) to the T-loading gear side.
7. After the mounting of the parts, turn the pulley of the loading drive assembly 2 – 3 turns in the clockwise direction viewed from the motor shaft.

1-5-2. Check and Adjustment of Tension Pole Position

1. Set the deck to play mode with the front loading assembly removed.
2. Make sure the left end of the tension sleeve is 8 ± 1 mm away from the main base edge as illustrated.
3. If necessary, loosen the screw and adjust the mounting position of the band bracket.

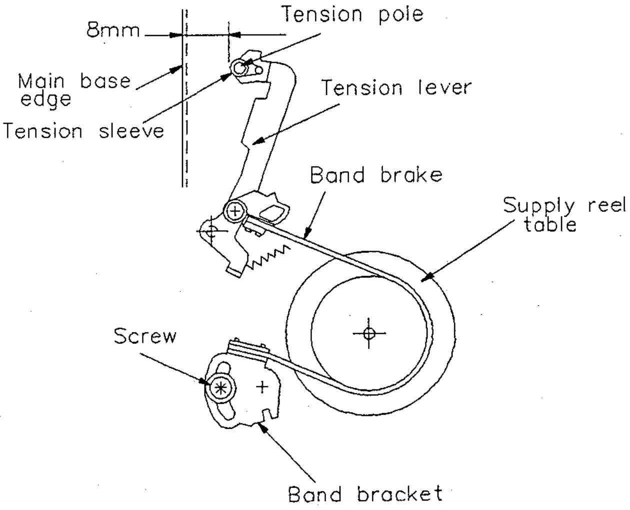

8mm
Tension pole
Main base edge
Tension lever
Tension sleeve
Band brake
Supply reel table
Screw
Band bracket

Fig. 5-2-1 Tension pole position

1-5-3. Reel Torque

(1) Reel torque

1. REVIEW mode
   Excessive torque will cause damage to the tape during REVIEW mode. On the other hand, poor torque may not wind the tape.
2. Record/Playback (take-up side) mode
   Too little torque does not rewind the tape to the end. If too large the tape may be stretched by excessive tension.
3. Inspection
   Rewind the torque cassette (recorded in SP mode) to the end, then check the torque values shown below.
   Review 135 – 195g-cm
   Record/Playback 55 – 135g-cm

For checking the method, refer to the following item "(2) Reel torque check".

(2) Reel torque check

1. First, record a TV broadcast program on the entire torque cassette tape (KT-300NR).
2. Load the torque cassette in the VTR and feed forward the tape before proceeding with measurement.
3. Set the VTR to the REVIEW mode and feed the tape for about 15 sec., and then make sure the take-up torque of 135 – 195g-cm is obtained while observing the left torque meter.
4. After completion of step 3, set the VTR to the PLAY mode and feed the tape for about 30 sec. Read the right torque meter and check the torque of 55 – 135g-cm is obtained.
5. When the review torque and playback torque are out of limit, replace the clutch assembly.
6. When the clutch assembly and the idle gear are replaced, perform the reel torque check.
7. Confirmation and adjustment of the back tension are performed by using a back tension cassette gauge. First, make sure that the tension pole is positioned correctly. (Refer to item 1-5-2).
   Load a back tension cassette and set the VTR to the PLAY mode.
   Make sure the meter is indicating 40 – 55 gf-cm.
   If the value is out of limit, first make sure the tension level spring is normal, and then replace the tension regulator assembly as required. (Refer to item 1-4-6).

PRECAUTIONS FOR USE OF TORQUE CASSETTE (KT-300NR)

1. Before loading a torque cassette in a VTR, always remove tape slack. The tape slack can be removed by rotating the reel to its take-up direction. (The tape tends to slack when there is no reel brake actions.)
2. When the torque cassette is loaded, confirm followings:
   a. Make sure the tape does not ride up or over the No. 8 cap. If it does, do not eject the tape but bring the tape to its correct position, taking care not to damage the tape.
   b. Make sure the tape is not slackened, if slackened, operate the VTR in FF or REW mode and then stop the tape. Then make sure the tape is not slackened again.
   c. After above confirmation, proceed to the reel torque adjustments and confirmation.
3. Cautions for removal of torque cassette
   a. When removing the torque cassette from the VTR, set the VTR to the STOP mode and wait for several seconds. Then, make sure the tape is not slackened. Push the EJECT button to remove the cassette.
   b. When removing the torque cassette from the VTR, also make sure the tape is not slackened inside the cassette lid before pulling the cassette from the VTR. If the tape is slackened inside the lid, carefully bring the tape in place and then pull the cassette.
4. If the previous precautions 1, 2 and 3 are not performed properly, the tape may be damaged and correct measurements can not be performed.
5. Do not use worn out or damaged tape, if used they may damage video heads on the cylinder. In such a case always replace the tape with a new one.
   The replacement tape is of E-180 type, 6.01 ± 0.3m in length.

1-5-4. Tape Transport System

The tape transport system has been precisely adjusted in the factory, so no check and alignment are necessary except the followings:

- Noises observed on the screen
- Tape damage
- Parts, shown in the adjustment procedures for the tape transport system, item 1-4-3, were replaced.

< Adjustment reference >

Lower flange height of No. 8 guide is used as the basic reference for the transport adjustment. To keep height of the No. 8 guide, do not apply excessive force onto the main base to prevent the main base from deformation.

(1) Location of tape transport adjustment

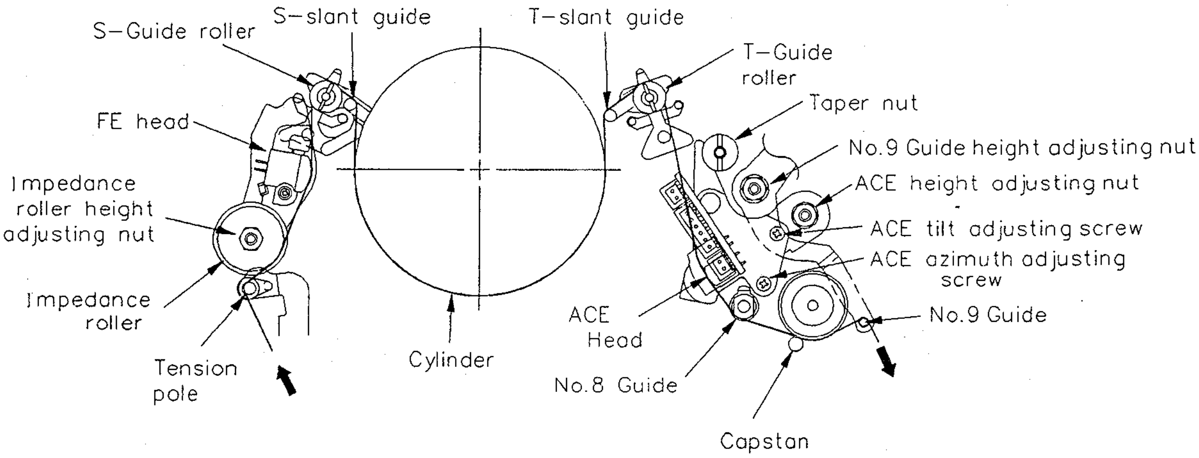

S-Guide roller
S-slant guide
T-slant guide
T-Guide roller
Taper nut
No.9 Guide height adjusting nut
ACE height adjusting nut
ACE tilt adjusting screw
ACE azimuth adjusting screw
No.9 Guide
FE head
Impedance roller height adjusting nut
Impedance roller
Tension pole
Cylinder
ACE Head
No.8 Guide
Capstan

Fig. 5-4-1 Location of tape transport adjustment

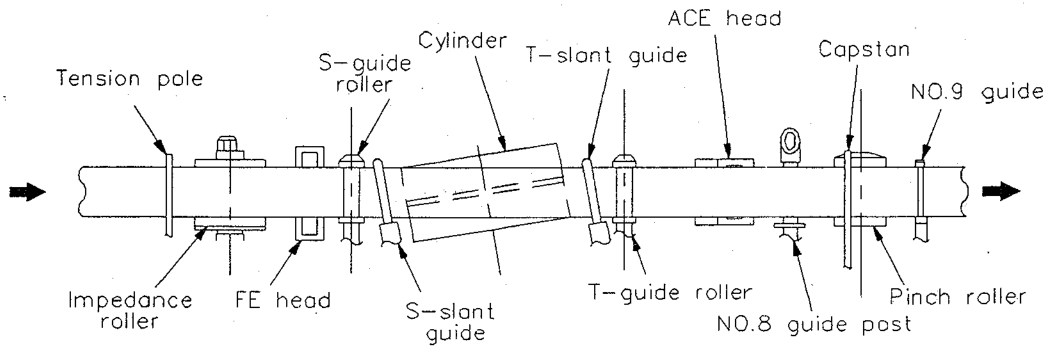
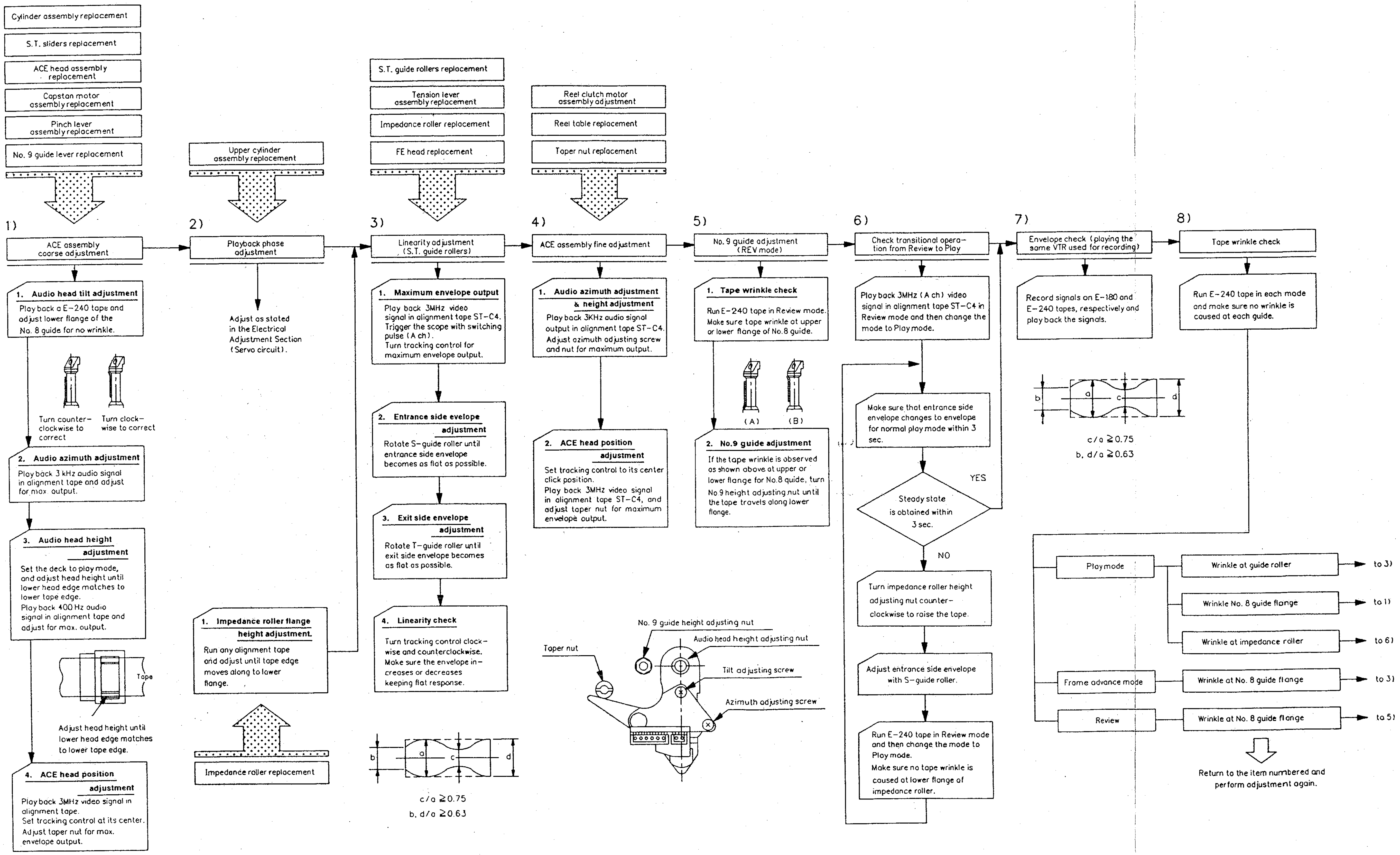

ACE head
Cylinder
T-slant guide
Capstan
S-guide roller
Tension pole
NO.9 guide
Impedance roller
FE head
S-slant guide
T-guide roller
Pinch roller
NO.8 guide post

Fig. 5-4-2 Tape travel diagram

(2) Tape transport system adjustment flow chart


Cylinder assembly replacement
S.T. sliders replacement
ACE head assembly replacement
Capstan motor assembly replacement
Pinch lever assembly replacement
No. 9 guide lever replacement
1)
ACE assembly coarse adjustment
1. Audio head tilt adjustment
Play back a E-240 tape and adjust lower flange of the No. 8 guide for no wrinkle.
Turn counter-clockwise to correct
Turn clock-wise to correct
2. Audio azimuth adjustment
Play back 3 kHz audio signal in alignment tape and adjust for max. output.
3. Audio head height adjustment
Set the deck to play mode, and adjust head height until lower head edge matches to lower tape edge.
Play back 400 Hz audio signal in alignment tape and adjust for max. output.
Tape
Adjust head height until lower head edge matches to lower tape edge.
4. ACE head position adjustment
Play back 3MHz video signal in alignment tape.
Set tracking control at its center.
Adjust taper nut for max. envelope output.
Upper cylinder assembly replacement
2)
Playback phase adjustment
Adjust as stated in the Electrical Adjustment Section (Servo circuit).
1. Impedance roller flange height adjustment.
Run any alignment tape and adjust until tape edge moves along to lower flange.
Impedance roller replacement
S.T. guide rollers replacement
Tension lever assembly replacement
Impedance roller replacement
FE head replacement
3)
Linearity adjustment (S.T. guide rollers)
1. Maximum envelope output
Play back 3MHz video signal in alignment tape ST-C4.
Trigger the scope with switching pulse (A ch).
Turn tracking control for maximum envelope output.
2. Entrance side evelope adjustment
Rotate S-guide roller until entrance side envelope becomes as flat as possible.
3. Exit side envelope adjustment
Rotate T-guide roller until exit side envelope becomes as flat as possible.
4. Linearity check
Turn tracking control clock-wise and counterclockwise.
Make sure the envelope in-creases or decreases keeping flat response.
b
a
c
d
c/a ≧0.75
b, d/a ≧0.63
Reel clutch motor assembly adjustment
Reel table replacement
Taper nut replacement
4)
ACE assembly fine adjustment
1. Audio azimuth adjustment & height adjustment
Play back 3KHz audio signal output in alignment tape ST-C4.
Adjust azimuth adjusting screw and nut for maximum output.
2. ACE head position adjustment
Set tracking control to its center click position.
Play back 3MHz video signal in alignment tape ST-C4, and adjust taper nut for maximum envelope output.
Taper nut
No. 9 guide height adjusting nut
Audio head height adjusting nut
Tilt adjusting screw
Azimuth adjusting screw
5)
No. 9 guide adjustment (REV mode)
1. Tape wrinkle check
Run E-240 tape in Review mode.
Make sure tape wrinkle at upper or lower flange of No.8 guide.
(A)
(B)
2. No.9 guide adjustment
If the tape wrinkle is observed as shown above at upper or lower flange for No.8 guide, turn No.9 height adjusting nut until the tape travels along lower flange.
6)
Check transitional opera-tion from Review to Play
Play back 3MHz (A ch) video signal in alignment tape ST-C4 in Review mode and then change the mode to Play mode.
Make sure that entrance side envelope changes to envelope for normal play mode within 3 sec.
Steady state is obtained within 3 sec.
YES
NO
Turn impedance roller height adjusting nut counter-clockwise to raise the tape.
Adjust entrance side envelope with S-guide roller.
Run E-240 tape in Review mode and then change the mode to Play mode.
Make sure no tape wrinkle is caused at lower flange of impedance roller.
7)
Envelope check (playing the same VTR used for recording)
Record signals on E-180 and E-240 tapes, respectively and play back the signals.
b
a
c
d
c/a ≧0.75
b, d/a ≧0.63
8)
Tape wrinkle check
Run E-240 tape in each mode and make sure no wrinkle is caused at each guide.
Play mode
Wrinkle at guide roller
to 3)
Wrinkle No. 8 guide flange
to 1)
Wrinkle at impedance roller
to 6)
Frame advance mode
Wrinkle at No. 8 guide flange
to 3)
Review
Wrinkle at No. 8 guide flange
to 5)
Return to the item numbered and perform adjustment again.

(3) Tape transport system adjustment

- **Pre-adjustment**

When the part(s) listed in Table 5-4-1 is replaced, perform required adjustments by referring to procedures for the tape transport system.
When the part(s) listed in Table 5-4-1 is replaced, the tape path may be changed and may damage alignment tape. To prevent this, first run a E-240 tape and make sure excessive tape wrinkle does not occur at each tape guide.

1. If tape wrinkle is observed at the lower flange of the impedance roller, decreases the lower flange height.
2. If tape wrinkle is observed at the S, T-guide rollers, turn the S, T-guide rollers until wrinkle disappears.
3. If the tape wrinkle is observed at the No. 8 guide, perform the tilt adjustment of the ACE head.

Table 5-4-1

Parts replacement	Adjustment procedure
● Cylinder complete assembly ● S, T-sliders ● ACE head assembly ● Capstan motor assembly ● Pinch lever assembly ● Cylinder motor ● No. 9 guide lever assembly	From item 1)
● Upper cylinder	From item 2)
● S, T-guide rollers ● Tension lever assembly ● Impedance roller ● FE head ● No. 8 guide sleeve	From item 3)
● Reel clutch assembly ● Reel table (S, T) ● Taper nut	From item 4)

- **Adjustment procedures**

1) ACE head assembly coarse adjustment

a. ACE tilt adjustment

1. Play back a E-240 tape and observe running condition of the tape at the lower flange of No. 8 guide.

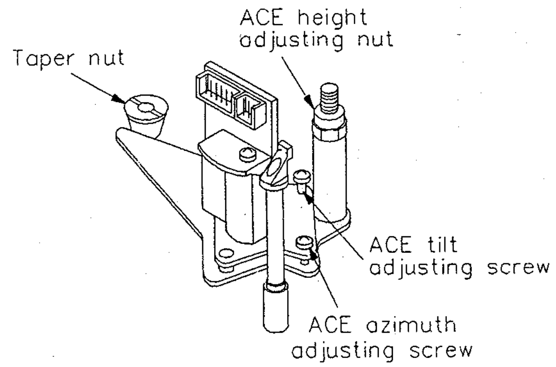


Fig. 5-4-3 ACE head assembly

2. Adjust the ACE tilt adjusting screw until tape wrinkle is caused at the lower flange of No. 8 guide as shown in Fig. 5-4-4(A).
3. Turn the ACE tilt adjusting screw counterclockwise until the tape travels along the lower flange as shown in Fig. 5-4-4(B).

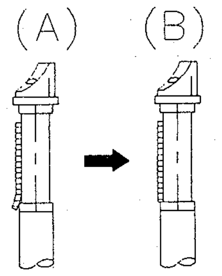


Fig. 5-4-4 No. 8 guide check

b. Audio azimuth adjustment

1. Play back the 3 kHz audio signal on the alignment tape ST-C4.
2. Connect a millivoltmeter to the audio line output terminal.
3. Turn the ACE azimuth adjusting screw to obtain maximum audio output.

c. Audio head height adjustment

1. Run the alignment tape (ST-C4) in the playback mode.
2. Observe surface of the audio head using a dental mirror.
3. Turn the ACE height adjusting nut so that lower tape edge matches to the lower edge of the control head.
4. Play back the 400 Hz audio signal in the alignment tape (ST-C4) and adjust the head height for maximum audio output.

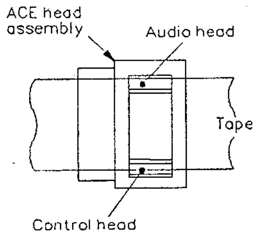


Fig. 5-4-5 Head height

d. ACE head position pre-adjustment

1. Play back the 3 MHz video signal in the alignment tape (ST-C4).
2. Adjust the taper nut for maximum video signal output after the tracking control is set at its center position.

2) Playback phase adjustment

Perform the adjustment according to the methods stated in the electrical adjustment "Servo Circuit".

3) Linearity adjustment (S, T-guide rollers adjustment)

1. Play back the 3 MHz (A ch) video signal on the alignment tape (ST-C4).
2. Observe the video RF signal envelope on an oscilloscope triggered by the video switching pulse.
3. Make sure the video envelope waveform (in its maximum output) meets the specification shown in Fig. 5-4-6.

Note:

a = maximum output of the video RF envelope
b = minimum output of the video RF envelope at the entrance side
c = minimum output of the video RF envelope at the center point
d = minimum output of the video RF envelope at the exit side

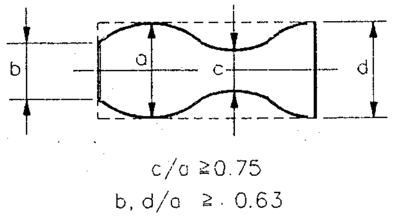


Fig. 5-4-6 Envelope waveform adjustment

4. If the A section in Fig. 5-4-7 does not meet the specification, adjust the S-guide roller in up or down direction.
5. If the B section in Fig. 5-4-7 does not meet the specification, adjust T-guide roller in up or down direction.

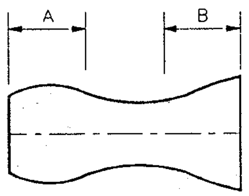


Fig. 5-4-7 Adjustment points

6. After completion of the adjustment(s), turn the tracking control and make sure video envelope variations are almost flat.
Next, play back the 3 MHz signal on the alignment tape (ST-C4) and make sure the video RF envelope variations are also flat when the tracking control is turned.
7. If the envelope varies as shown in Fig. 5-4-8, adjustment of the S, T-guide rollers may be upset, if so perform the adjustment again.

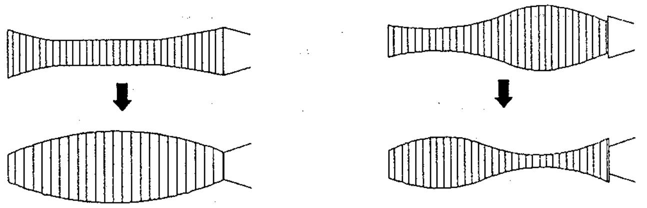


Fig. 5-4-8 Abnormal variation of the waveform

4) ACE head assembly fine adjustment

a. Tape wrinkle check at the lower flange of No. 8 guide

1. If tape wrinkle is observed at the lower flange of No. 8 guide, adjust the ACE tilt adjusting screw counterclockwise as shown in Fig. 5-4-3 until the wrinkle disappears.
2. If a gap is observed between the lower flange of No. 8 guide and the lower edge of tape, adjust the ACE tilt adjusting screw clockwise until the tape travels along the lower flange.

Note:

This adjustment should be made using a beginning part of E-240 tape.

b. Azimuth adjustment

1. Play back the 3 kHz audio signal on the alignment tape (ST-C4).
2. Adjust the ACE azimuth adjusting screw for maximum audio output as shown in Fig. 5-4-3.

c. Head height adjustment

1. Play back the alignment tape.
2. Adjust the ACE height adjusting nut for maximum audio output.

d. ACE head position adjustment

1. Play back the 3 MHz (Ach) video signal on the alignment tape (ST-C4).
2. Place the tracking control at its center click position.
3. Trigger the oscilloscope with the video switching pulse and observe the video RF envelope waveform.
4. Turn the taper nut slowly and fix the taper nut at the position where the video envelope reaches a peak level.

Note:
If video RF signal is not observed with the tracking control set to the center position, perform the ACE head adjustment to obtain maximum video RF envelope in each mode, again.

5. Play back the audio signal on the alignment tape (ST-C4) and make sure the audio output is maximum.

5) No. 9 guide lever adjustment

1. Set the VTR to Cue mode with E-240 tape (at beginning portion) loaded. Switch the Cue mode to the Review mode when the tape has been rewound into the T-reel table to some extent.
2. Check tape wrinkle at the upper and lower flange of No. 8 guide.
   Adjust the No. 9 height adjusting nut so that the tape runs along the lower flange.
3. Set the VTR to the Cue mode again and make sure the tape is not twisted between the capstan and the No. 9 guide. If twisted, adjust the No. 9 guide height and the adjustment in step 1 again.

Note:
When making the adjustment, do not mistake the ACE head height adjusting nut for the No. 9 adjusting nut.

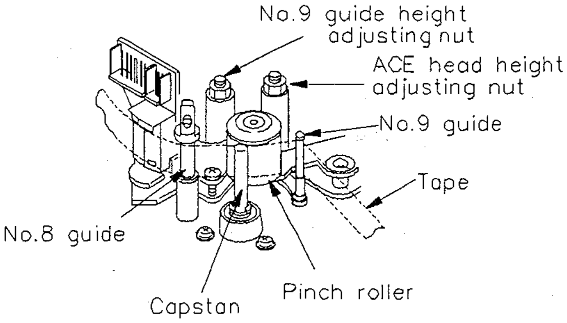

No.9 guide height adjusting nut
ACE head height adjusting nut
No.9 guide
Tape
No.8 guide
Pinch roller
Capstan

Fig. 5-4-9 No. 9 guide lever adjustment

6) Check for transitional operation from Review to Play

1. Play back the 3 MHz (A ch) video signal on the alignment tape (ST-C4) in Review mode and observe the video RF envelope with the oscilloscope.
2. Switch the Review mode to the Play mode.
   When switched to the Play mode, make sure the entrance side envelope comes to an approximate steady state within 3 seconds as shown in Fig. 5-4-10.

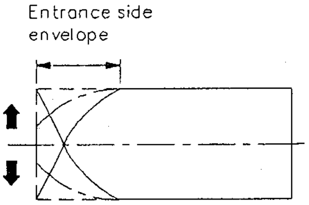


Fig. 5-4-10 Video envelope rising when operation mode is switch from review to play mode

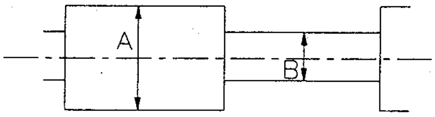
If it does not rise within 3 seconds, adjust as follows:

3. Turn the impedance roller nut counterclockwise to adjust the lower flange height.
   Make sure the tape travels along the lower flange.
4. Since entrance side linearity varies as the height of the lower flange of the impedance roller is varied, adjust the S-guide roller to correct the linearity.
5. Change operation mode from the Review to the Play mode again and make sure the entrance side envelope rises within 3 seconds. If not, perform the adjustment again from item 3.
6. Play back the E-180 tape in the Play mode and make sure no tape wrinkle occurs at the lower flange of the impedance roller.
   If excessive tape wrinkle occurs, turn the impedance roller nut clockwise until the wrinkle disappears and then perform adjustment from item 4.

Note:
If the rising characteristic is poor in Review mode, screen noises may occur in synchronous editing recording.
Perform the adjustment carefully.

7) Envelope check

1. Make recordings and play back on E-180 and E-240 tapes, and make sure the playback output envelope meets the specification shown in Fig. 5-4-6.
2. In playback using the same video deck as used for the recording, (with a E-180) the video envelope should meet the specification shown in Fig. 5-4-11.



• B/A ≦ 0.55

Fig. 5-4-11 Envelope output and output level difference

3. If the performance does not meet both specifications 1 and 2 above, replace the upper cylinder assembly.
4. Confirm operation of the synchronous editing, using a beginning portion a E-180 tape.
5. If picture noises are observed at the starting position of the editing, adjust the height of the lower flange of the impedance roller again.

8) Tape wrinkle check

1. Play back the E-240 tape in the playback, Cue, Review and the frame feeding mode, and observe tape wrinkle at each guide.
2. If excessive tape wrinkle is observed at the mode shown below, perform the associated adjustments also shown below.
   a. Playback mode
      Tape wrinkle at the S, T-guide roller section
         Item 3: Linearity adjustment
      Tape wrinkle at No. 8 guide flange
         Item 1: ACE head assembly coarse adjustment
      Tape wrinkle at impedance roller flange
         Item 6: Check for transitional operations from Review to Play
   b. Review mode
      Tape wrinkle at No. 8 guide
         Item 5: No. 9 guide lever adjustment
   c. Frame feeding mode
      Tape wrinkle at No. 8 guide
         Item 3: Linearity adjustment

2. ELECTRICAL ADJUSTMENT

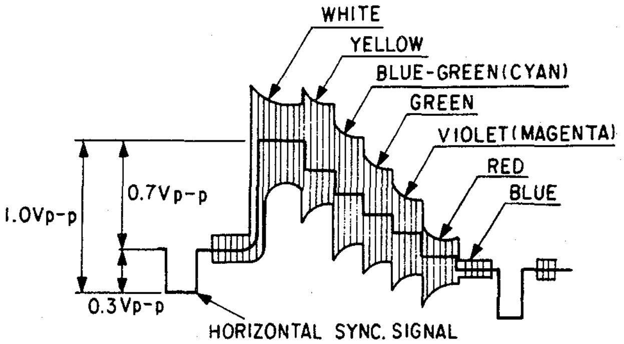
< Test equipment required >

Adjustment will be performed with the following test equipment.

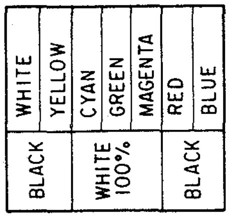
1. Color TV (Monitor)
2. Oscilloscope, 2 CHs, 15 MHz or higher with delay system
3. Frequency counter (7 digits or higher)
4. Millivoltmeter
5. Digital voltmeter
6. Tester (20 K ohm/V)
7. Audio generator
8. Audio attenuator
9. Alignment tapes
   Part code: ST-C4: 70909302
10. Alignment screw driver (jig)
11. Color pattern generator
12. Video sweep generator

< Color bar signal >

Color bar signals of 75 % recorded on the alignment tapes are shown in Fig. 2-1-1.


WHITE
YELLOW
BLUE-GREEN(CYAN)
GREEN
VIOLET(MAGENTA)
RED
BLUE
1.0Vp-p
0.7Vp-p
0.3Vp-p
HORIZONTAL SYNC. SIGNAL

Color bar signal waveform


WHITE
YELLOW
CYAN
GREEN
MAGENTA
RED
BLUE
BLACK
WHITE 100%
BLACK

Color bar pattern

Fig. 2-1-1

< Specified input and output levels, and impedance >

Video input:	Negative sync, standard composite video signal 1 Vp-p, 75 ohm
Video output:	Same as the video input 1Vp-p, 75 ohm
Audio input:	–3.8 dBm
Audio output:	–3.8 dBm

Alignment sequence

Proceed the alignments in the sequence as shown in Fig. 2-1-2.

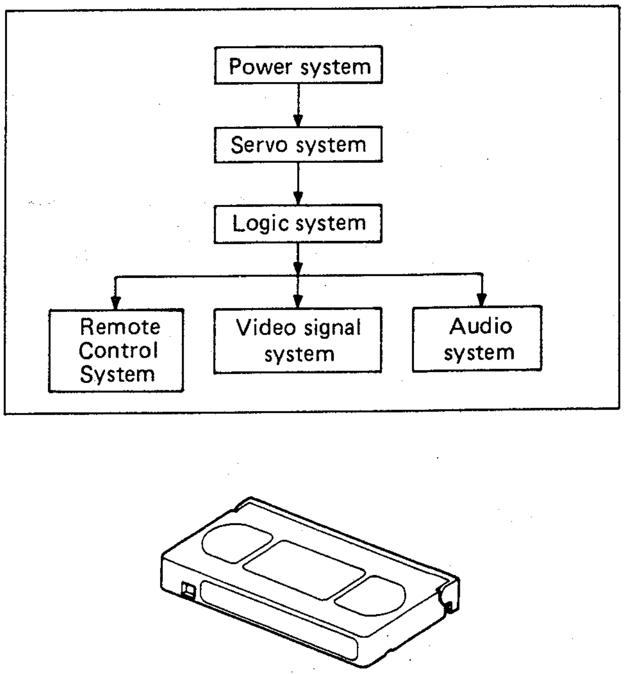
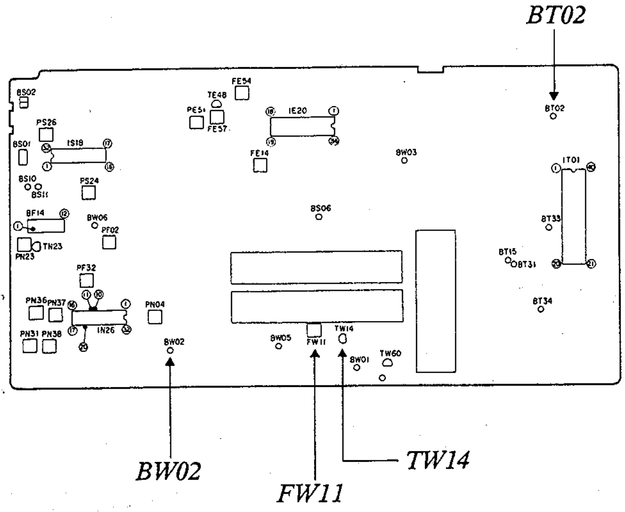

Power system
Servo system
Logic system
Remote Control System
Video signal system
Audio system

Fig. 2-1-2

Alignment tape specifications

[1] ST-C4

Segment	System	Playback Time (min.)	Video Signal	Video Signal	Applications
1	PAL & SECAM	10	Mono Scope	1 kHz	Servo checks and adjustment
2	PAL & SECAM	10	3 MHz Ach	400Hz	Tape path checks and adjustment
3	PAL	5	Color bar	3 kHz	Video and Sound checks and adjustment
4	SECAM	5	Color bar	3 kHz	Video and Sound checks and adjustment
5	MESECAM	5	Color bar	3 kHz	Video and Sound checks
6	NTSC	5	Color bar	1 kHz	Video and Sound checks



Main PC Board (V-110F, V-120F, V-130F)

2-1. PIF Circuit

2-1-1. 6.5 MHz Trap (V-110F, V-120F, V-130F)

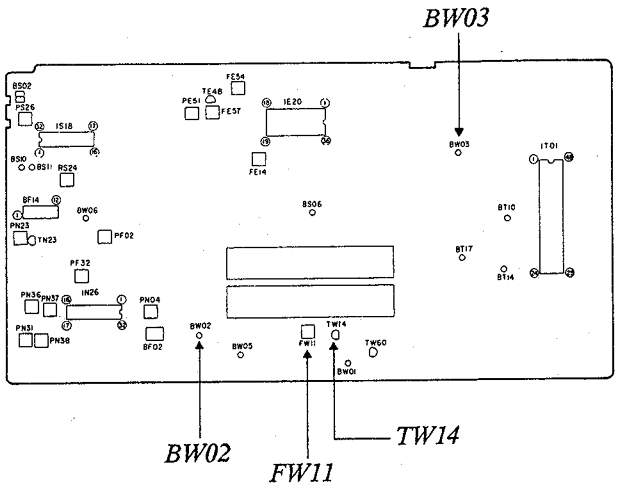
Test point: TW14, emitter
Test equipment: Oscilloscope
Adjusting point: FW11

1. Set the VTR to "Tuner – EE" mode.
2. Apply any standard TV signal to the tuner.
3. Connect an oscilloscope to TW14, emitter.
4. Adjust FW11 for min. 6.5 MHz level.

2-1-2. 5.5 MHz Trap (V-170F, V-180F)

Test point: TW14, emitter
Test equipment: Oscilloscope
Adjusting point: FW11

1. Set the VTR to "Tuner – EE" mode.
2. Apply any standard TV signal to the tuner.
3. Connect an oscilloscope to TW14, emitter.
4. Adjust FW11 for min. 5.5 MHz level.



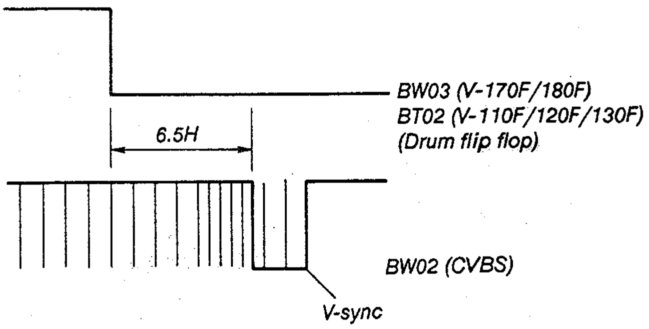
Main PC Board (V-170F, V-180F)

2-2. Servo Circuit

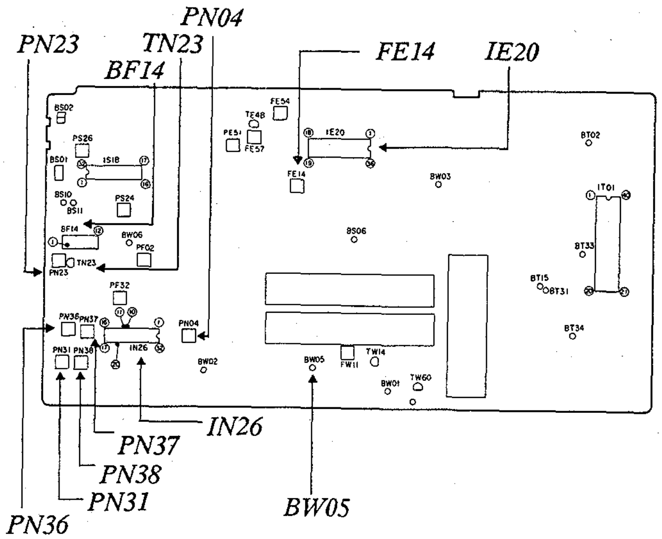
2-2-1. Head Switching Point Setting (Playback Phase)

Test point: BW02, BT02 (V-110F, V-120F, V-130F)
BW03 (V-170F, V-180F)
Test equipment: Oscilloscope
Adjusting point: ————

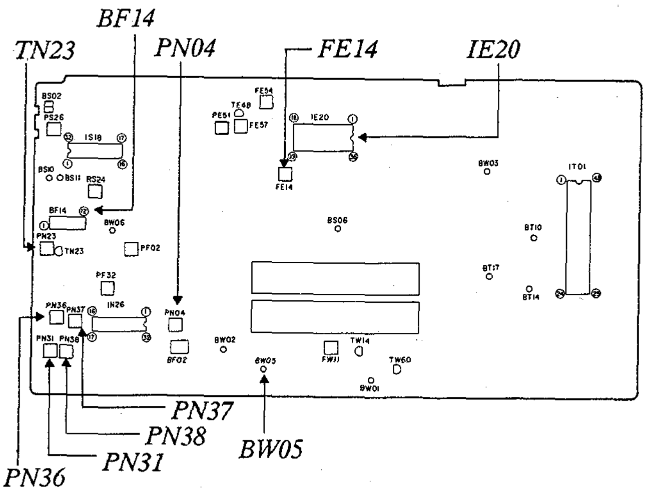
1. Load the video cassette into the VTR. (ST-C4, PAL mode)
2. Connect a dual trace oscilloscope to the main board, BT02 (V-110F, V-120F, V-130F), BW03 (V-170F, V-180F) and BW02.
3. Set the VTR to the play mode.
4. Provide for a quite good tracking adjustment.
5. Confirm that there is no timer programmed.
6. Press the keys "Timer" and "–" at the same time. After about 1 second press the "Playback" key. Confirm that the head switching point is in the range of 6.5 ± 1.0 H.



2-3. Video Circuit



Main PC Board (V-110F, V-120F, V-130F)



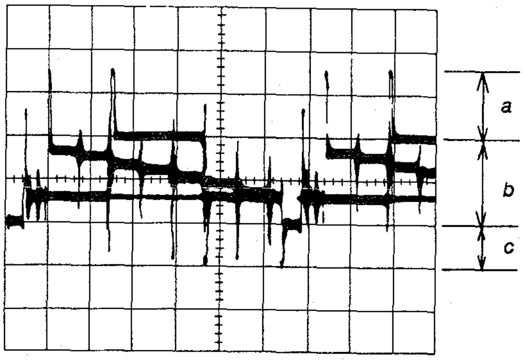
Main PC Board (V-170F, V-180F)

Note:
Set the channel to "AV" when feeding signal to LINE terminals.

2-3-1. White Clip, Dark Clip

Test point: IN26 pin 20
Test equipment: Oscilloscope
Adjusting point: PN36, PN37

1. Feed the PAL color bar signal to the line input terminals and set the VTR to the EE mode.
2. Connect the oscilloscope to IN26 pin 20 and trigger the scope with HD pulse at BW05. Adjust the scope so that a waveform is displayed for approx. 2H period.
3. Adjust PN37 so that overshoot appearing the white peak side shows 90 ± 5% of the Y signal level.
4. Adjust PN36 so that an undershoot appearing on the sync tip side shows 60 ± 5% of the Y signal level.



a : b = 100 : 90
a : c = 100 : 60

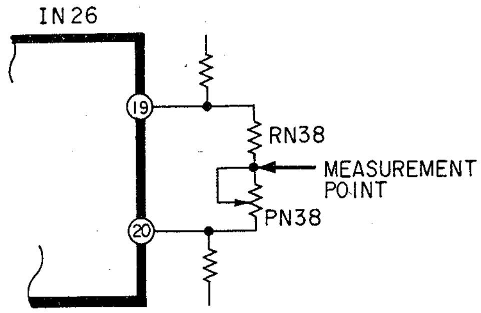
2-3-2. Sync Tip Frequency

Test point: TN23 emitter
Test equipment: Frequency counter
Adjusting point: PN31

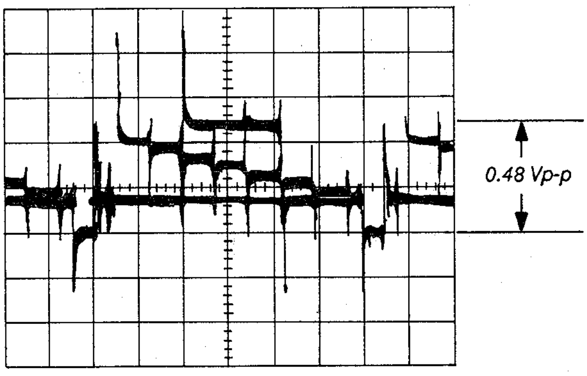
1. Short circuit the line input terminals with a phono jack and set the VTR to the REC mode.
2. Connect the frequency counter to TN 23 emitter.
3. Adjust PN31 to obtain frequency reading of 3.83 ± 0.1 MHz.

2-3-3. FM Deviation

Test point: Illustration below.
Test equipment: Oscilloscope
Adjusting point: PN38, PN04



1. Feed the color bar signal to the line input terminals.
2. Connect the oscilloscope to the measurement point and trigger the scope with a composite sync signal at BW05. Adjust the scope so that a waveform is displayed for approx. 2H period.
3. Adjust PN38 to obtain the amplitude of approx. 0.48Vp-p between the sync tip and the white peak. After adjusting PN04 (Playback Y signal output level) with the method 2-3-10, repeat above adjustment procedures, and then adjust PN38 (FM deviation control) so that the playback Y signal output level at BW02 shows 2.0 ± 0.15Vp-p.

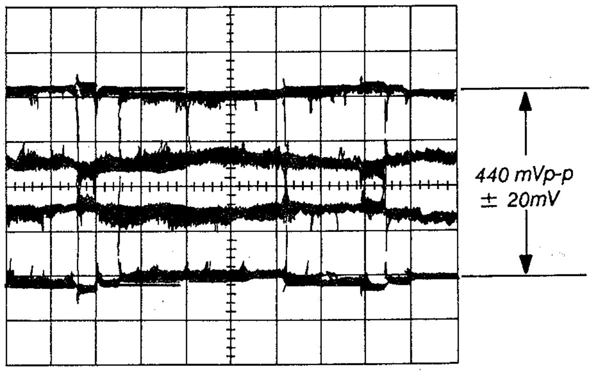


Horizontal axis: 10µs/div.
Vertical axis: 0.2V/div.

2-3-4. REC FM Level

Test point: TN23 emitter
Test equipment: Oscilloscope
Adjusting point: PN23

1. Feed a color bar signal to the line input terminals and set the VTR to the REC mode.
2. Connect the oscilloscope to TN23 emitter and trigger the scope with HD pulse at BW05. Adjust the scope so that a waveform is displayed for approx. 2H period.
3. Adjust PN23 so that amplitude of "Black level" portion shows 440 mVp-p ± 20 mV.

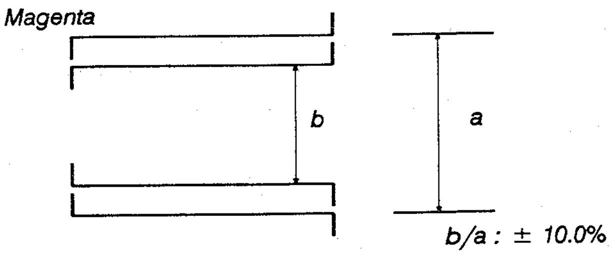


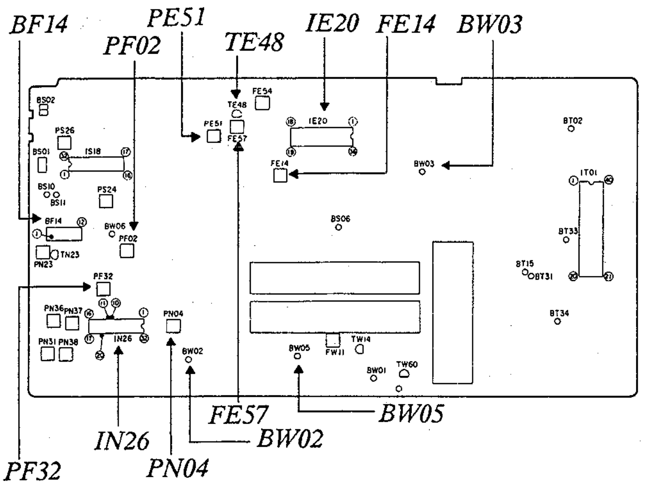
Horizontal axis: 10µs/div.
Vertical axis: 0.1V/div.

2-3-5. Record Input Bell

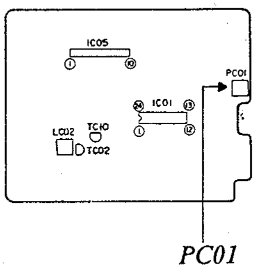
Test point: IE20 pin 15
Test equipment: Oscilloscope
Adjusting point: FE14

1. Feed the SECAM color bar signal to the line input terminals and set the VTR to the REC mode.
2. Connect the oscilloscope input probe to IE20 pin 15 and the trigger input terminal to BW05. Adjust the scope to display signal approx. 2H.
3. Adjust FE14 until the level difference of the color signal magenta becomes as shown below.




BF14
PE51
PF02
TE48
IE20
FE14
BW03
FE57
BW05
IN26
BW02
PF32
PN04

Main PC Board (V-110F, V-120F, V-130F)

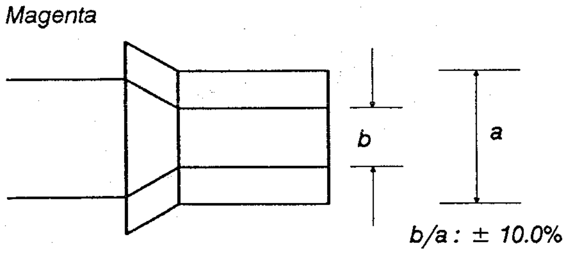

IC05
PC01
IC01
LC02
TC10
TC02
PC01

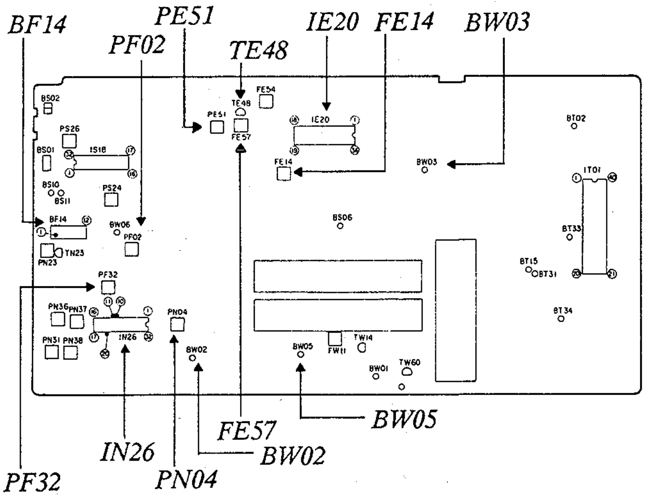
CHV PC Board

2-3-6. Record Output Bell

Test point: TE48 emitter
Test equipment: Oscilloscope
Adjusting point: FE14

1. Feed the SECAM color bar signal to the line input terminals and set the VTR to the REC mode.
2. Connect the oscilloscope input probe to TE48 emitter and trigger input terminal to BW05. Adjust the scope to display signal approx. 2H.
3. Adjust FE14 so that amplitude (a) of magenta for (n)th line and amplitude (b) of magenta for (n + 1)th line become the same.


Magenta
b
a
b/a : ± 10.0%

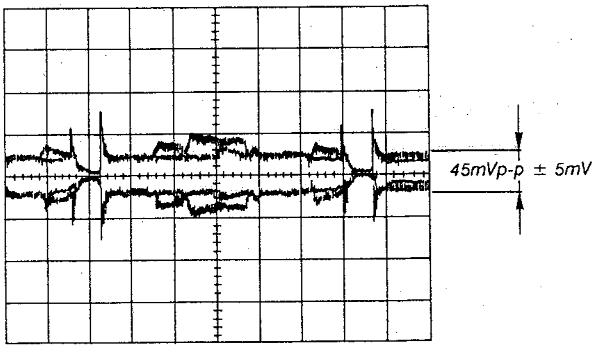

BF14
PE51
PF02
TE48
IE20
FE14
BW03
FE57
BW05
IN26
BW02
PF32
PN04

Main PC Board (V-170F, V-180F)

2-3-7. SECAM Color Record Level

Test point: BF14 pin 1
Test equipment: Oscilloscope
Adjusting point: PE51

1. Feed the SECAM color bar signal to the line input terminals and set the VTR to the REC mode.
2. Connect the oscilloscope to BF14 pin 1 and trigger the scope with HD pulse at BW05. Adjust the scope so that a waveform is displayed for approx. 2H period.
3. Adsjut PE51 so that amplitude of the magenta portion shows 45mVp-p ± 5mV.

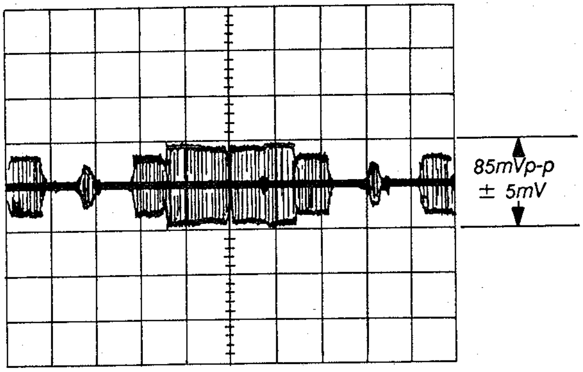


Horizontal axis : 10 μs/div.
Vertical axis : 0.05V/div.

2-3-8. PAL Color Record Level (V-170F, V-180F)

Test point: BF14 pin 1
Test equipment: Oscilloscope
Adjusting point: PC01

1. Feed the PAL color bar signal to the line input terminals and set the VTR to the REC MODE.
2. Connect the oscilloscope to BF14 pin1, and trigger the scope with HD pulse at BW05. Adjust the scope so that a waveform is displayed for approx. 2H period.
3. Adjust PC 01 so that amplitude of the red portion shows 85mVp-p ± 5mV.

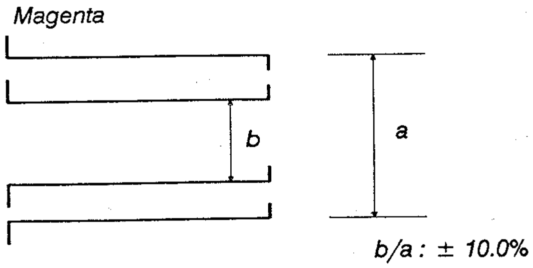


Horizontal axis: 10µs/div.
Vertical axis: 0.05V/div.

2-3-9. Playback Input Bell

Test point: IE20 pin 15
Test equipment: Oscilloscope
Adjusting point: FE57

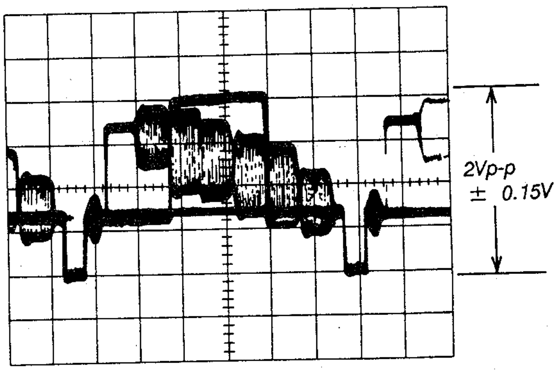
1. Playback the alignment tape (SECAM color bar signal).
2. Connect the oscilloscope input probe to IE20 pin 15 and the trigger input terminal to BW05. Adjust the scope to display signals approx. 2H.
3. Adjust FE57 until the magenta amplitude of color signal becomes flat.
4. Make sure the color phase does not shift on picutre.



2-3-10. Playback Y Signal Output Level

Test point: BW02
Test equipment: Oscilloscope
Adjusting point: PN04

1. Playback the alignment tape (PAL color bar signal).
2. Connect the oscilloscope to BW02 and trigger the scope with HD pulse at BW05.
   Adjust the scope so that a waveform is displayed for approx. 2H period.
3. Adjust PN04 so that amplitude of 2.0 Vp-p ± 0.15V is obtained between the sync tip and the 100% white level.

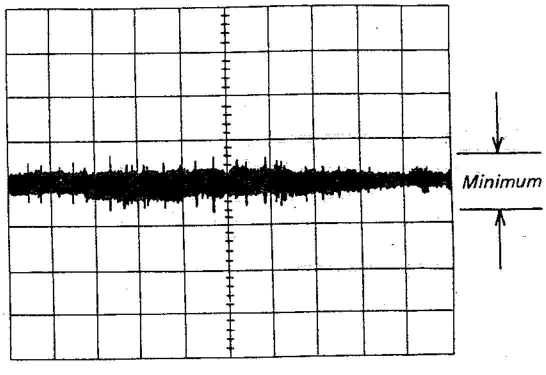


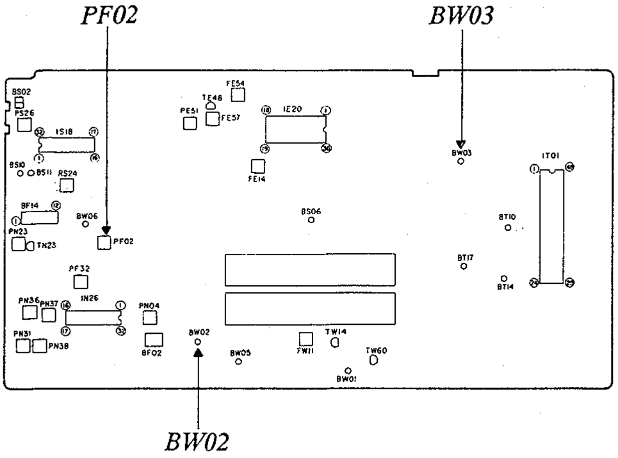
Horizontal axis: 10µs/div.
Vertical axis: 0.05V/div.

2-3-11. Y Comb-filter Balance

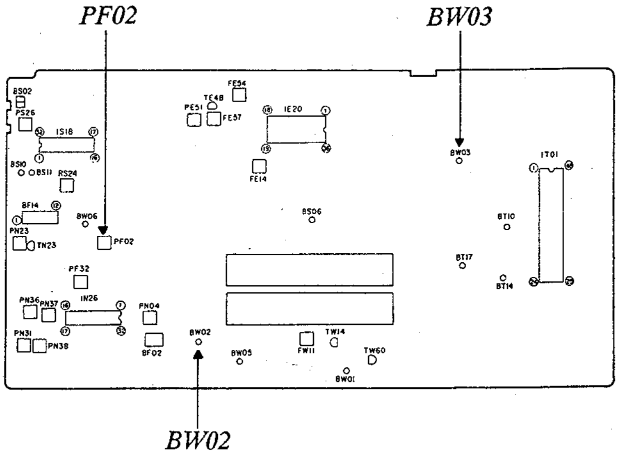
Test point: IN26 pin 10, and pin 11
Test equipment: Oscilloscope
Adjusting point: PF32

1. Playback the alignment tape (PAL color bar signal).
2. Connect the oscilloscope (CH-1) to IN26 pin 10 and the (CH-2) to IN26 pin 11, and trigger the scope with HD pulse at BW05.
   Adjust the scope so that a waveform is displayed for approx. 2H period.
3. Adjust the scope so that amplitude gain for each channel is the same.
4. Set polarity of the CH-2 to the negative (INV) mode.
5. Set the scope to ADD mode which adds signals in the CH-1 and CH-2.
   Adjust PF32 so that amplitude on the scope display shows minimum. (Ignore glitches).




PF02
BW03
BW02
IE20
IS18
IT01
IN26
BS06
BW06
PF32
PN04
BF02
TW14
FW11
TW60
BW01
BW05
FE14
FE54
FE57
RS24
TN23

Main PC Board (V-110F, V-120F, V-130F)

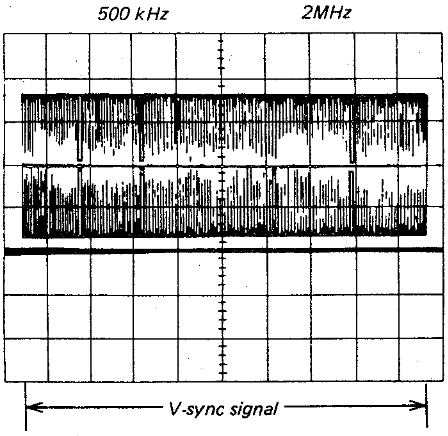

PF02
BW03
BW02
IE20
IS18
IT01
IN26
BS06
BW06
PF32
PN04
BF02
TW14
FW11
TW60
BW01
BW05
FE14
FE54
FE57
RS24
TN23

Main PC Board (V-170F, V-180F)

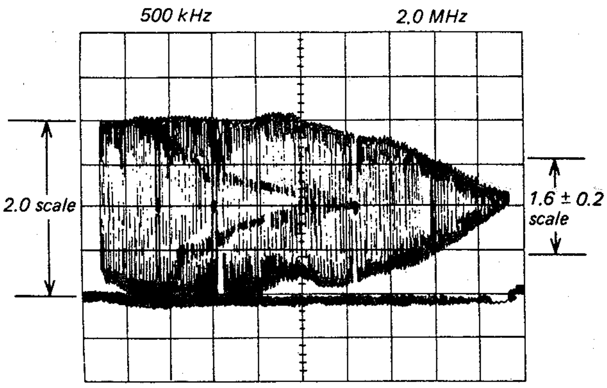
2-3-12. Picture Sharpness Preset

Test point: BW02
Test equipment: Oscilloscope
Adjusting point: PF02

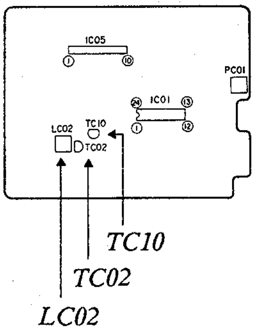
1. Record and playback a video sweep signal fed to the line input terminals.
2. Connect the oscilloscope to BW02 and trigger the scope with a signal at BW03.
   Adjust the scope so that a waveform is displayed for more than 1V (vertical sync) period.
3. Adjust PF02 so that relative amplitude at 2 MHz shows 1.6 ± 0.2 (scale), where amplitude at 500 KHz is assumed as "A" (A = 2 scale).



Input sweep signal



Playback waveform of BW02


IC05
PC01
IC01
LC02
TC10
TC02
TC10
TC02
LC02

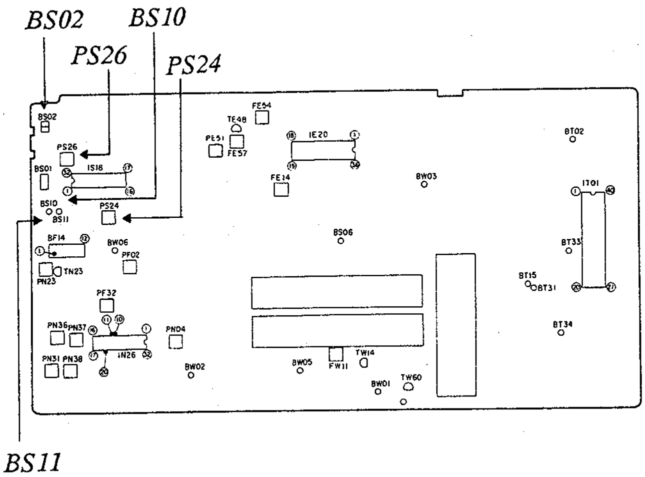
CHV PC Board

2-3-13. 5.06 MHz Trap (V-170F, V-180F)

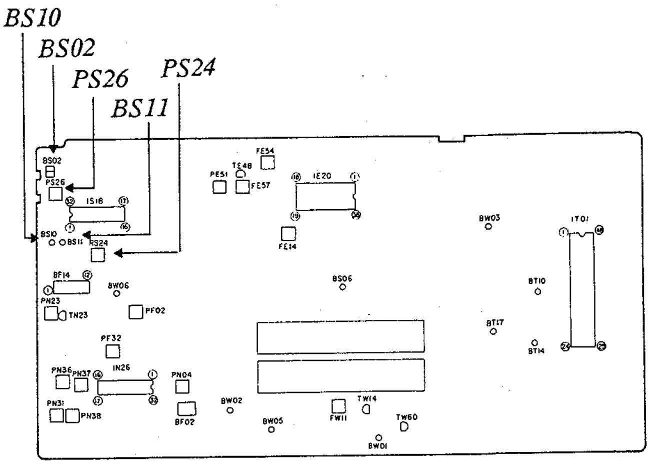
Test point: TC10, TC02
Test equipment: Oscilloscope
Adjusting point: LC02

1. Set the VTR to playback mode.
2. Apply a 5.06 MHz sine signal (400mVp-p) to TC10, base via a 100 pF series capacitor.
3. Connect the oscilloscope to TC02, emitter.
4. Adjust LC02 for minimum level.

2-4. Audio Circuit



Main PC Board (V-110F, V-120F, V-130F)



Main PC Board (V-170F, V-180F)

Note:

- * Adjustments for the playback frequency response and playback output level may not be performed if the audio control head is improperly positioned on the audio track. In such a case, perform the azimuth adjustment and height adjustment perfectly, and then proceed with the adjustments 2-4-1 to 2-4-5.
- * When using alignment tapes other than those specified below always make sure that interchangeability is assured for the tapes before proceeding the adjustments.

2-4-1. Playback Output Level

Test point: Audio line output terminal
Test equipment: Millivoltmeter
Adjusting point: PS24

1. Connect 47K ohm to the audio line output terminal and playback the alignment tape (ST-C4).
2. Adjust PS24 until output level obtains –3.8 dBs ± 0.5 dB.

2-4-2. Record/Erase Oscillator Frequency

Test point: BS02 pin 2, GND
Test equipment: Frequency counter

1. Connect the frequency counter across BS02 pin 2 and GND.
2. Set the VTR to record mode and check that the frequency counter shows 72 ± 4 kHz.

2-4-3. Bias Current

Test point: BS10 and BS11
Test equipment: Millivoltmeter
Adjusting point: PS26

1. Short circuit the audio line input terminal, creating a no input signal condition. Connect a millivoltmeter to BS10 and BS11 (GND).
2. Set the VTR to the record mode and adjust PS26 to obtain 3.5 mVrms.

2-4-4. Record/Playback Frequency Charqacteristics

Test point: Audio line output terminal
Test equipment: Millivoltmeter
Adjusting point: PS26

1. Connect a 47K ohm resistor to the audio line output terminal.
2. Apply 400 Hz and 8 kHz signal of –25 dBs to audio line input terminal, and record the signal.
3. Playback the signals just recorded and check that the output of 8 kHz is 0 dB $^{+4\,dB}_{-5\,dB}$, referred to the output of 400 Hz.
4. If the 8 kHz output level is higher than that of 400 Hz by more than 4 dB, adjust the bias current to a value higher than 3.5 mVrms, and if the 8 kHz output is lower than that by less than –5dB, adjust the bias current to a value lower than 3.5 mVrms.

2-4-5. Record/Playback Output Level

Test point: Audio line output terminal
Test equipment: Millivoltmeter

1. Connect a 47K ohm resistor to the audio line output.
2. Feed 400Hz –3.8 dBs signal to the audio line input terminal and record the signal.
3. Confirm to see the playback output level is –3.8 dBs ± 3 dB.

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SECTION 3
SERVICING DIAGRAMS

1. Inspection Procedure

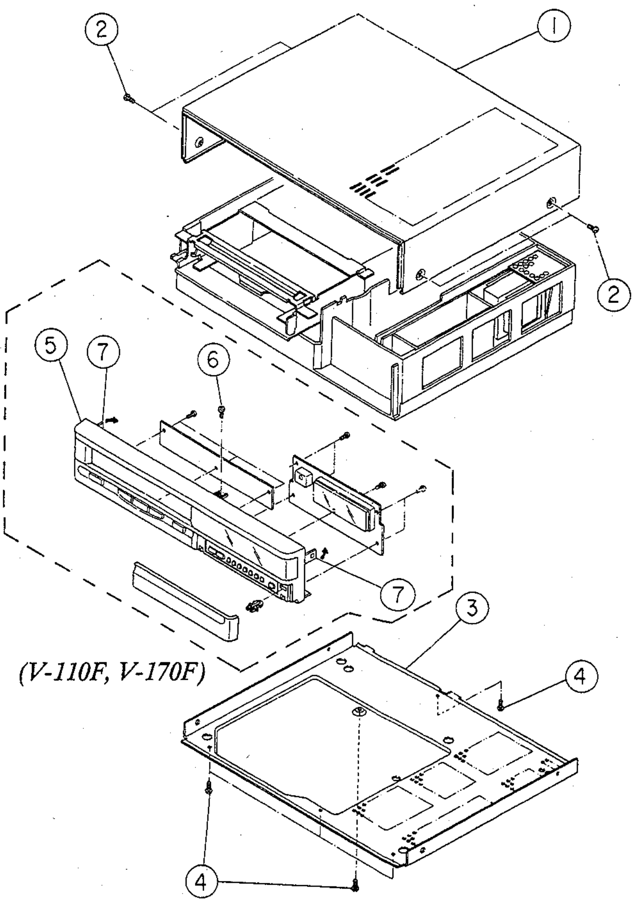
Operation steps		Items to be confirmed	Inspection block	Page	
				Block Diagram	Circuit Diagram
1. AC Plug-in	Time setting Program timer setting	Clock display Time setting operation	Power (AC system) Key display	3-10 3-13	3-35 3-37
2. Power SW ON	Timer/counter, Memory Channel selection, AFC operation, EE picture & tone quality	Mode display lamp TV receive condition, Channel select operation, AFC operation level, EE picture quality, Tone signal level	Power Logic RF reception Video (EE, Rec mode) Audio (EE, Rec mode)	3-10 3-18, 23 3-11 3-28 3-33	3-35 3-51, 55 3-39, 47 3-39, 47 3-39, 47
3. Cassette-in and Cassette-out	Cassette-in Cassette loading Eject Cassette-out	F/L mecha. operation Cassette loading operation Eject operation Indicator lamp Abnormal sound	Logic	3-18, 23	3-51, 55
4. Key entry operation Remote control	REC, PLAY Cue/Review Still, Frame feeding FF/REW	Indicator lamp Each mode operation (Tape drive operation) Abnormal sound	Logic Remote control	3-18, 23	3-51, 55 3-58
5. Special Functions Fully Automatic Play Auto Rewind Repeat playback	Cassette-in at Power OFF (Without safety tab) REC/PLAY/CUE Press the play button for 6 sec.	Power ON, Cassette down Automatic Play Rewind automatically after tape wound Repeat playback from the beginning.	Power Logic	3-10 3-18, 23	3-35 3-51, 55
6. Playback Function Picture Sharpness Tone Quality Others	PLAY (Test tape: ST-C4) Cue/Review Still	Resolution, S/N Hue, Saturation, Color unevenness, Color dropout, Sound distortion, Level variation, Picture noise, Jitter Picture swing, Skew distortion, Flicker, Beat	Video PLAY system Audio PLAY system Servo system	3-28 3-33 3-18, 23	3-39, 47 3-39, 47 3-51, 55
7. REC/PLAY Functions Picture Sharpness Tone Quality Others	REC/PLAY	Resolution, S/N Hue, Saturation, Color unevenness, Color dropout, Sound distortion, Level variation, Picture noise, Jitter Picture swing, Skew distortion, Flicker, Beat	Video PLAY system Audio PLAY system Servo system	3-28 3-33 3-18, 23	3-39, 47 3-39, 47 3-51, 55

How to use the table

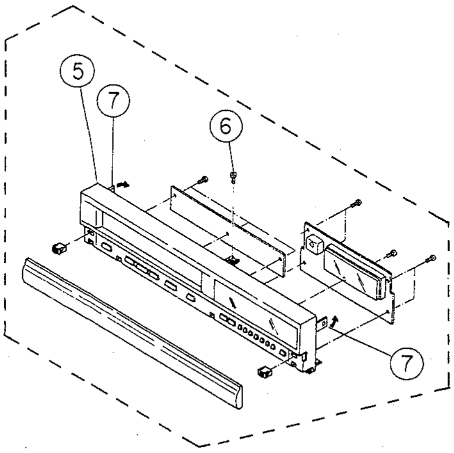
1. When inspecting a defective VTR, proceed according to the steps shown in the table.
2. Check the items to be confirmed for each operation step.
3. If a problem is found on the item, check waveforms (level) referring to the block diagram relating to the items.
4. Use PC board pattern diagram and schematic diagram to examine the circuit precisely.
5. After completion of the repair work, check steps 1 – 7 again.

2. Removal of Cabinet

1. Disconnect power cord plug from AC outlet.
2. Remove 4 screws ② securing top cover ① .
3. Remove the top cover ① by sliding it backward.
4. Remove 5 screws ④ securing bottom cover ③ , then remove the bottom cover.
5. Remove 1 screw ⑥ securing front panel ⑤ .
6. After pushing the left and right hooks ⑦ slightly to the direction of arrow mark, then put the hooks off from the notch of chassis.
7. Remove the front panel⑤.

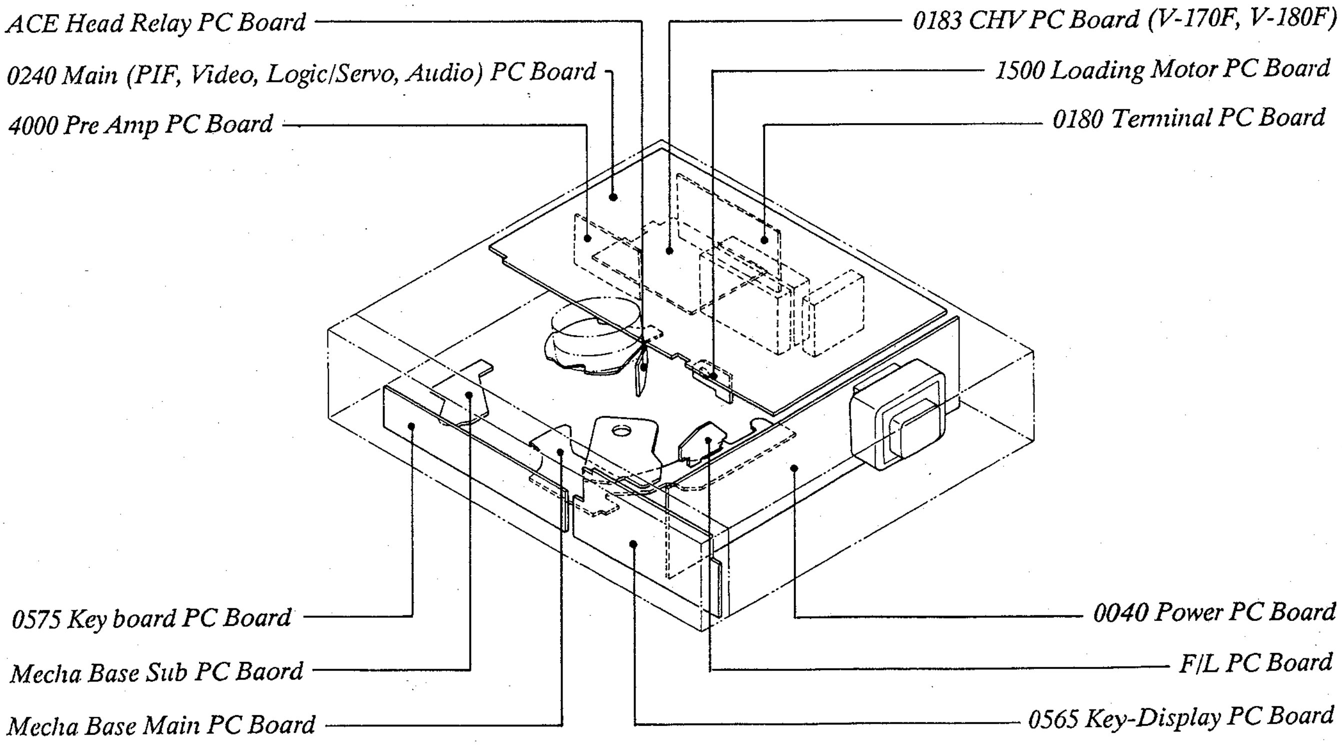

②
①
②
⑤
⑦
⑥
⑦
③
④
④

(V-110F, V-170F)



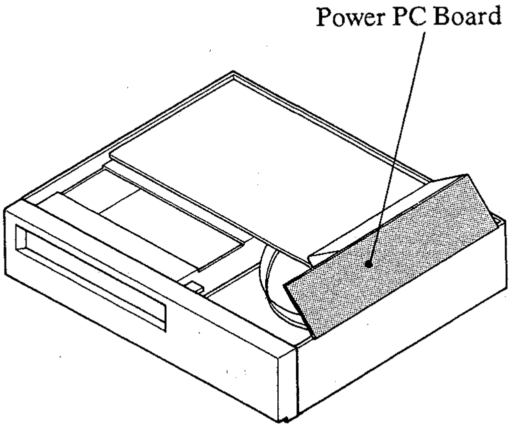
(V-120F, V-130F, V-180F)

3. Electrical Units Location Diagram

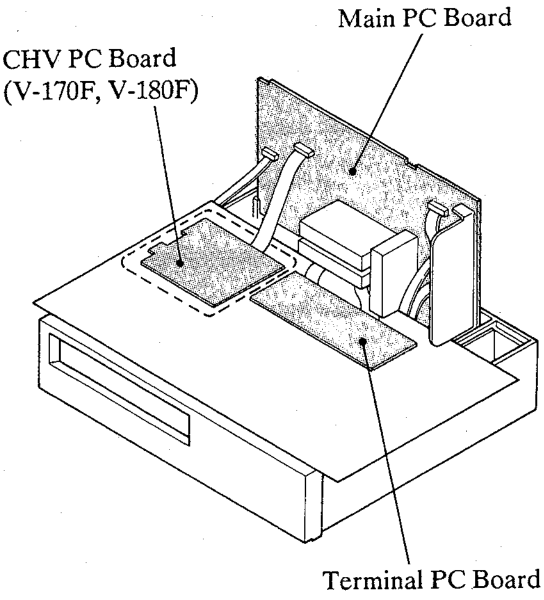

ACE Head Relay PC Board
0240 Main (PIF, Video, Logic/Servo, Audio) PC Board
4000 Pre Amp PC Board
0183 CHV PC Board (V-170F, V-180F)
1500 Loading Motor PC Board
0180 Terminal PC Board
0575 Key board PC Board
Mecha Base Sub PC Baord
Mecha Base Main PC Board
0040 Power PC Board
F/L PC Board
0565 Key-Display PC Board

4. Standing PC Boards for Servicing

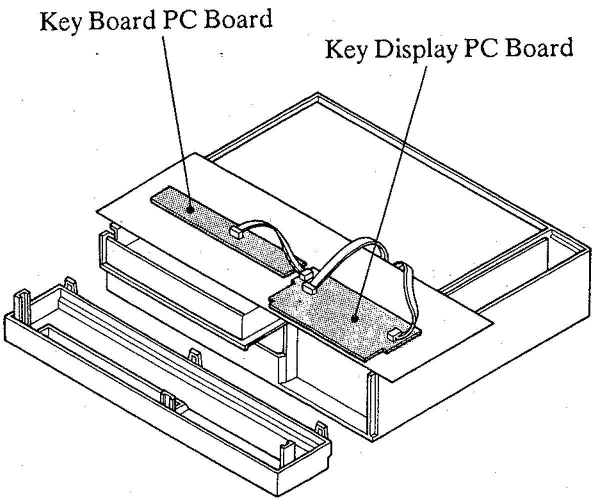
Power PC Board


Power PC Board

Main (PIF, Logic, Servo, Video, Audio), Terminal, CHV PC Board

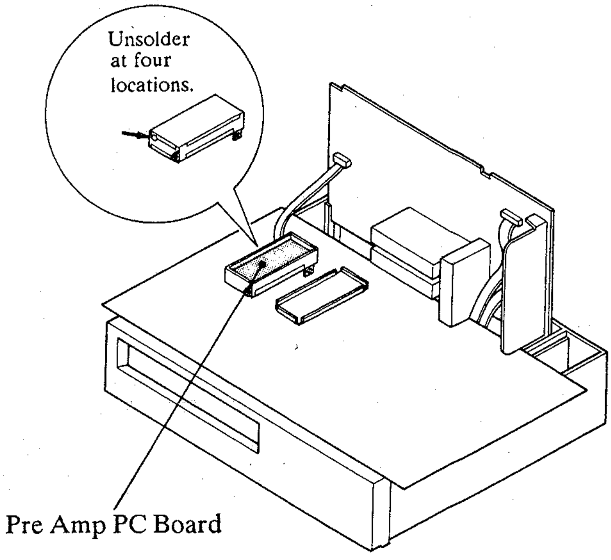

Main PC Board
CHV PC Board
(V-170F, V-180F)
Terminal PC Board

Key Display, Key Board PC Board


Key Board PC Board
Key Display PC Board

Pre Amp PC Board

Remove the shield plate.


Unsolder
at four
locations.
Pre Amp PC Board

5. Part Configuration and their Symbols

1. ICs

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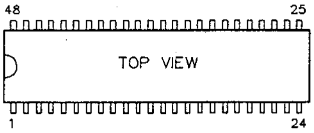
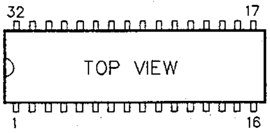
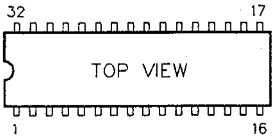
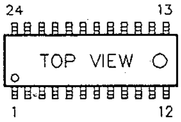
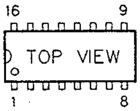
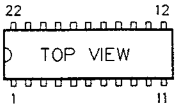
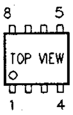
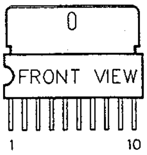
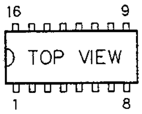
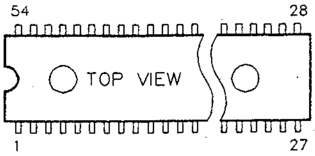
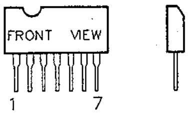
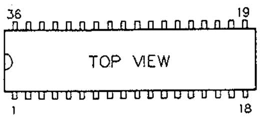
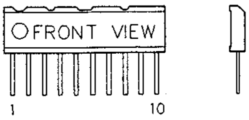
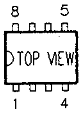
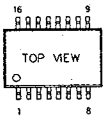
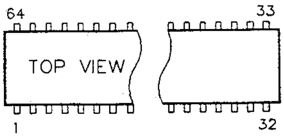
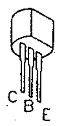
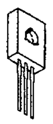
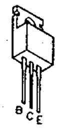
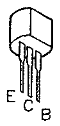
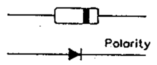
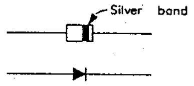
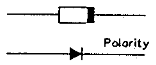
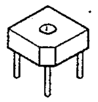
U2561B ZC407454CP	 48 25 TOP VIEW 1 24
BA7767AS	 32 17 TOP VIEW 1 16
BA7258AS	 32 17 TOP VIEW 1 16
LA7330	 24 13 TOP VIEW 1 12
MC74HC4053N MC14020BCP	 16 9 TOP VIEW 1 8
BA7212S	 22 12 TOP VIEW 1 11
IR-9106-K MSM7401RS	 8 5 TOP VIEW 1 4
BA6109	 0 FRONT VIEW 1 10
U2559B MC14094BCP	 16 9 TOP VIEW 1 8

NAME	SHAPE
M8716B	 54 28 TOP VIEW 1 27
BA7024	 FRONT VIEW 1 7
M51645P	 36 19 TOP VIEW 1 18
BA7604N	 FRONT VIEW 1 10
LF355	 8 5 TOP VIEW 1 4
HEF4053BT	 16 9 TOP VIEW 1 8
HD404019A46S	 64 33 TOP VIEW 1 32

2. TRANSISTORs

NAME	SHAPE
BC547B,BC548B BC547,BC558C BC548,BC337 BC558A,BC556B BC547C,BC327 BC558,BC548C	
BD435 BD676	
BD202	
BC558B BC369 BC557B	

3. DIODEs

NAME	SHAPE
1N4148 ZPD11 ZPD8.2	
1N4004	
ZPD24 ZTK33B ZPD5.1 1N4001 ZPY15 ZPD6.8	
S4VB10	

PRECAUTIONS FOR PART REPLACEMENT

* In the schematic diagram, parts marked ⚠ (ex. ⚠ F801) are critical part to meet the safety regulations, so always use the parts bearing specified part codes (SN) when replacing them.

* Using the parts other than those specified shall violate the regulations, and may cause troubles such as operation failures, fire, etc.

SOLID RESISTOR INDICATION

Resistor	1/6W film	P type film	U type film	Solid	Oxide film	Metal film	Cement	Fuse
Symbol	None	P	U	S	R	W	W	RF

Tolerance	±2%	±5%	±10%	±20%
Symbol	G	J	None	None

* All film type and oxide film resistors are ±5%, so the tolerance symbol was not indicated for them.

CAPACITANCE INDICATION

Description	Symbol	Capacitance, unit	Capacitance allowance
Electrolytic	+⊣⊢	µF	Not indicated
Special electrolytic			Indicated
Plastic film	⊣⊢	µF: indicated with numbers below decimal point	Indicated below ±5% (J), indicated below ±0.5pF, not indicated for others
Ceramic		pF: indicated with numbers over decimal point	
Trimmer	⊣⊬⊢	pF	Not indicated

Note: No working voltage is indicated for capacitors rated at 50V except electrolytic capacitors.

WAVEFORM AND VOLTAGE MEASUREMENT

* Measurement of waveform and voltage at each section in the color circuits was conducted with sufficient service color bar signal being received and reproduced in normal conditions.

* Waveforms and voltage values for the remaining circuit were measured with a broadcasting signal normally received, so they may vary slightly according to the programs being received. Use them as a measure for servicing.

* All voltage values except the waveforms are expressed in DC and measured by a digital voltmeter.

CHIP PART REPLACEMENT

(Use spare part with wire leads connected.)

1. Hold a Chip part to be removed with tweezers and apply heat to the solder at one end of the part with a soldering iron. (Fig. 1)
2. Apply heat to the solder at the other end of the part and remove it.
   The heating time should be as short as possible so the excessive heat is not applied to foil patterns and the PC Board.
3. If it is difficult to remove the part, temporarily stop the desoldering job and wait until temperature of the part lowers. Then, repeat steps 1 and 2.
4. Form leads of the replacement part (general part equivalent to the chip part) as shown in the figures and solder place. (Fig. 2)
5. Mount the replacement part so that it does not touch any other parts. (Fig. 3)

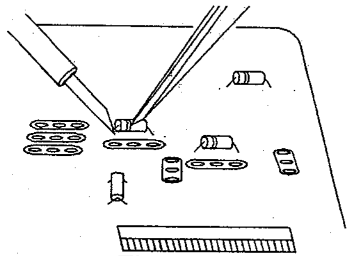


Fig. 1

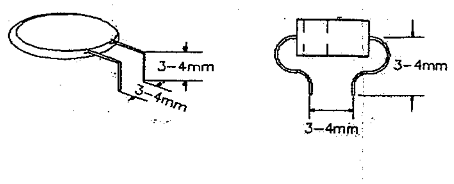


Fig. 2

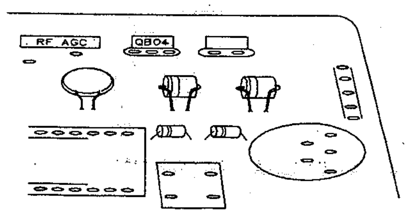


Fig. 3

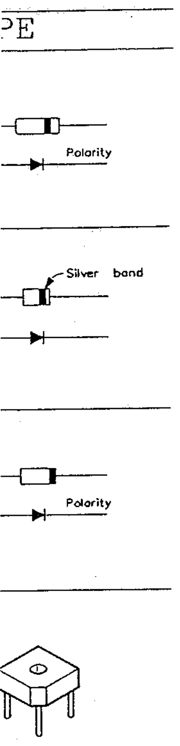
REPLACIN

1) Required
1. Fine tip
   30 Wat
2. Tweeze
3. Blower

2) Soldering
1. Do not
2. Avoid
3. Discard
4. Supple
5. Use ca
   chips.

3) Removal
1. Melt th
2. Grasp t
   the oth
3. Remove

4) Removal (
1. Melt the



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Resistor	1/6W film	P type film	U type film	Solid	Oxide film	Metal film	Cement	Fuse
Symbol	None	P	U	S	R	W	W	RF

Tolerance	±2%	±5%	±10%	±20%
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Ceramic		pF: indicated with numbers over decimal point	
Trimmer	⊣/⊢	pF	Not indicated

Note: No working voltage is indicated for capacitors rated at 50V except electrolytic capacitors.

WAVEFORM AND VOLTAGE MEASUREMENT

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4. Form leads of the replacement part (general part equivalent to the chip part) as shown in the figures and solder place. (Fig. 2)
5. Mount the replacement part so that it does not touch any other parts. (Fig. 3)

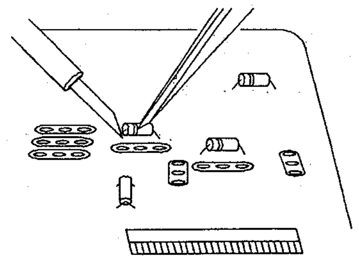


Fig. 1

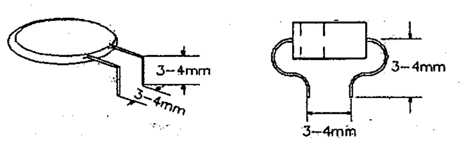


Fig. 2

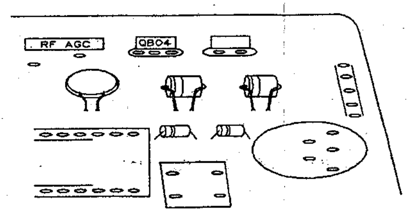


Fig. 3

REPLACING SUBMINIATURE "CHIP" PARTS

1) Required tools:
1. Fine tipped, well insulated soldering "pencil", about 30 Watts.
2. Tweezers
3. Blower type hair dryer.

2) Soldering cautions:
1. Do not apply heat for more than 3 seconds.
2. Avoid using a rubbing stroke when soldering.
3. Discard removed chips; do no reuse them.
4. Supplementary cementing is not required.
5. Use care not to scratch or otherwise damage the chips.

3) Removal (resistors, capacitors, etc.):
1. Melt the solder at one side.

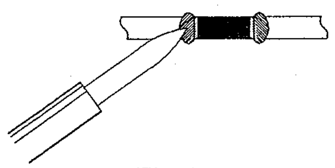


Fig. 1

2. Grasp the part with tweezers and melt the solder at the other side.

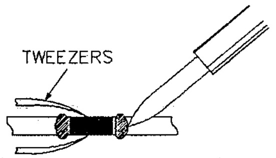


Fig. 2

3. Remove the part with a twisting motion.

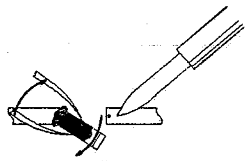


Fig. 3

4) Removal (transistors, diodes, etc.):
1. Melt the solder of one lead.

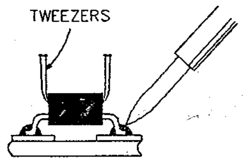


Fig. 4

2. Lift the side of that lead upward.

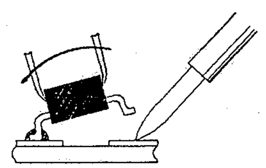


Fig. 5

3. Simultaneously heat solder the two remaining leads and lift part to remove.

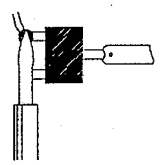


Fig. 6

5) Preheating (except for semiconductors):
Immediately before installing new resistors or capacitors, use a blower type hair dryer and preheat the part for about two minutes at approximately 150°C.

6) Replacement:
1. Presolder the contact points of the circuit pattern.

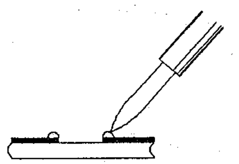


Fig. 7

2. Press the part downward with tweezers and apply the soldering pencil as indicated in the figure.

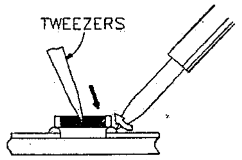
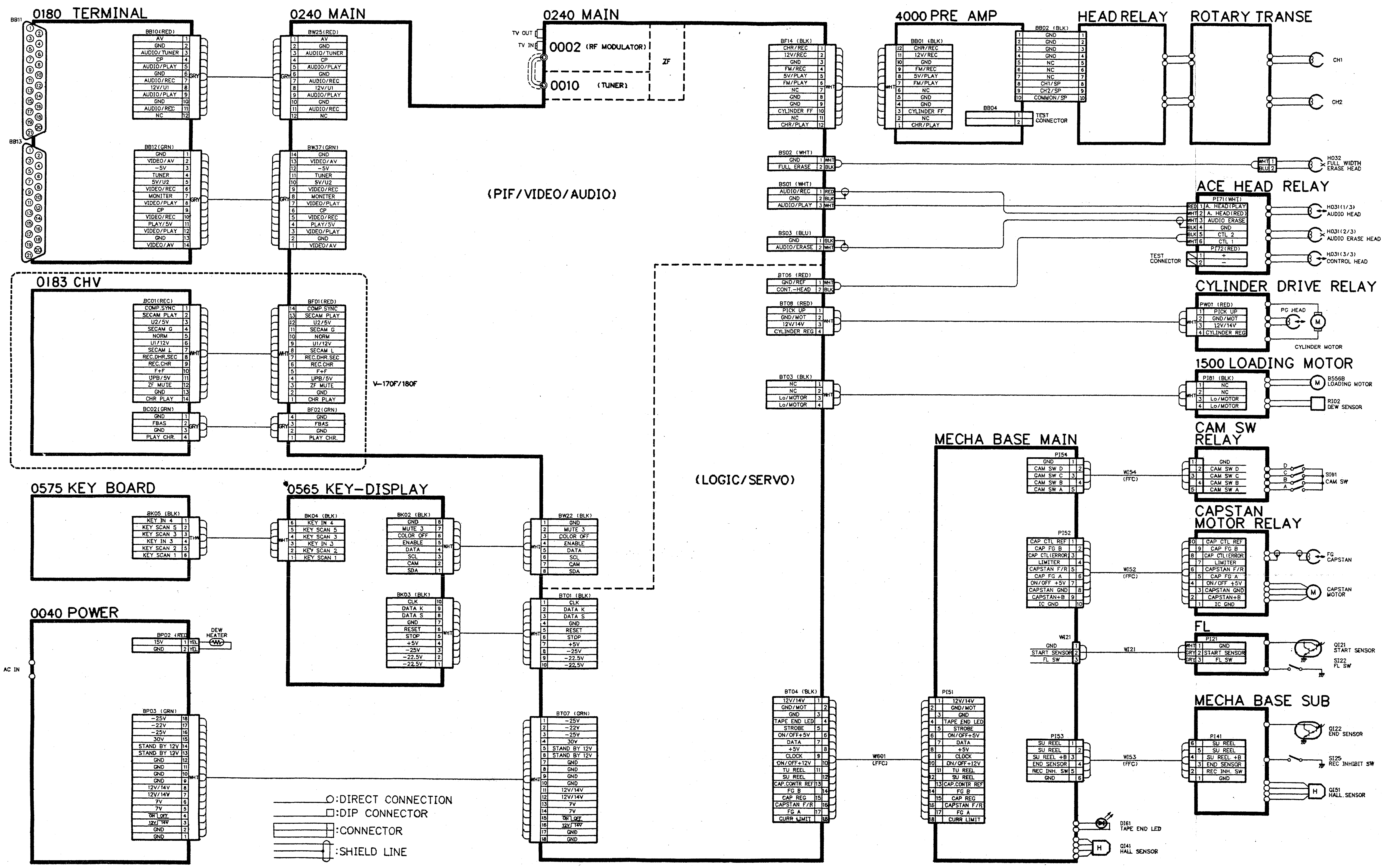


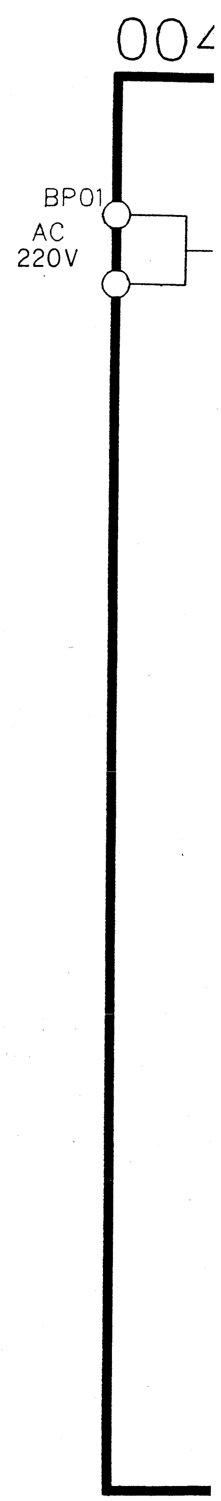
Fig. 8

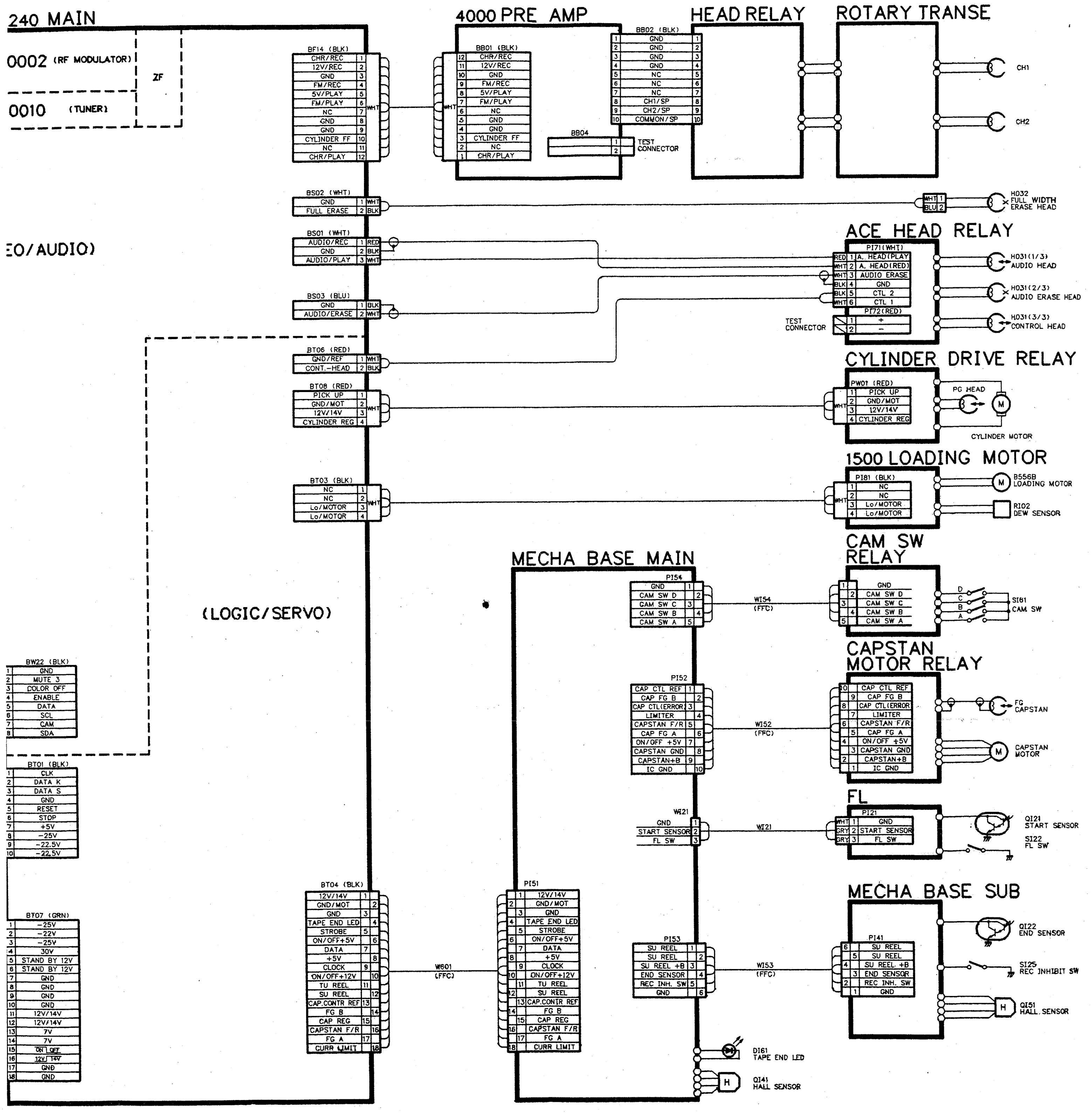
6. Printed Wiring Board and Schematic Diagram


0180 TERMINAL
BB11
BB13
BB10(RED)
AV 1
GND 2
AUDIO/TUNER 3
CP 4
AUDIO/PLAY 5
GND 6
AUDIO/REC 7
12V/U1 8
AUDIO/PLAY 9
GND 10
AUDIO/REC 11
NC 12
GRY
BB12(GRN)
GND 1
VIDEO/AV 2
-5V 3
TUNER 4
5V/U2 5
VIDEO/REC 6
MONITER 7
VIDEO/PLAY 8
CP 9
VIDEO/REC 10
PLAY/5V 11
VIDEO/PLAY 12
GND 13
VIDEO/AV 14
0240 MAIN
BW25(RED)
BW37(GRN)
0183 CHV
BC01(REC)
COMP.SYNC 1
SECAM PLAY 2
U2/5V 3
SECAM G 4
NORM 5
U1/12V 6
SECAM L 7
REC.DHR.SEC 8
REC.CHR 9
F+F 10
UPB/5V 11
ZF MUTE 12
GND 13
CHR PLAY 14
WHT
BF01(RED)
BC02(GRN)
GND 1
FBAS 2
GND 3
PLAY CHR. 4
BF02(GRN)
V-170F/180F
0575 KEY BOARD
BK05 (BLK)
KEY IN 4 1
KEY SCAN 5 2
KEY SCAN 3 3
KEY IN 3 4
KEY SCAN 2 5
KEY SCAN 1 6
THW
0565 KEY-DISPLAY
BK04 (BLK)
BK02 (BLK)
GND 8
MUTE 3 7
COLOR OFF 6
ENABLE 5
DATA 4
SCL 3
CAM 2
SDA 1
BK03 (BLK)
CLK 10
DATA K 9
DATA S 8
GND 7
RESET 6
STOP 5
+5V 4
-25V 3
-22.5V 2
-22.5V 1
0040 POWER
AC IN
BP02 (RED)
15V 1 YEL
GND 2 YEL
DEW HEATER
BP03 (GRN)
-25V 18
-22V 17
-25V 16
30V 15
STAND BY 12V 14
STAND BY 12V 13
GND 12
GND 11
GND 10
GND 9
12V/14V 8
12V/14V 7
7V 6
7V 5
ON OFF 4
12V 14V 3
GND 2
GND 1
0240 MAIN
TV OUT
TV IN
0002 (RF MODULATOR)
0010 (TUNER)
ZF
(PIF/VIDEO/AUDIO)
(LOGIC/SERVO)
BW22 (BLK)
BT01 (BLK)
BT07 (GRN)
BF14 (BLK)
CHR/REC 1
12V/REC 2
GND 3
FM/REC 4
5V/PLAY 5
FM/PLAY 6
NC 7
GND 8
GND 9
CYLINDER FF 10
NC 11
CHR/PLAY 12
BS02 (WHT)
GND 1 WHT
FULL ERASE 2 BLK
BS01 (WHT)
AUDIO/REC 1 RED
GND 2 BLK
AUDIO/PLAY 3 WHT
BS03 (BLU)
GND 1 BLK
AUDIO/ERASE 2 WHT
BT06 (RED)
GND/REF 1 WHT
CONT.-HEAD 2 BLK
BT08 (RED)
PICK UP 1
GND/MOT 2
12V/14V 3
CYLINDER REG 4
BT03 (BLK)
NC 1
NC 2
Lo/MOTOR 3
Lo/MOTOR 4
BT04 (BLK)
12V/14V 1
GND/MOT 2
GND 3
TAPE END LED 4
STROBE 5
ON/OFF+5V 6
DATA 7
+5V 8
CLOCK 9
ON/OFF+12V 10
TU REEL 11
SU REEL 12
CAP.CONTR REF 13
FG B 14
CAP REG 15
CAPSTAN F/R 16
FG A 17
CURR LIMIT 18
W601 (FFC)
4000 PRE AMP
BB01 (BLK)
BB02 (BLK)
GND 1
GND 2
GND 3
GND 4
NC 5
NC 6
NC 7
CH1/SP 8
CH2/SP 9
COMMON/SP 10
BB04
TEST CONNECTOR
HEAD RELAY
ROTARY TRANSE
CH1
CH2
H032 FULL WIDTH ERASE HEAD
ACE HEAD RELAY
PI71(WHT)
A. HEAD(PLAY
A. HEAD(RED)
AUDIO ERASE
GND
CTL 2
CTL 1
PI72(RED)
+
−
TEST CONNECTOR
H031(1/3) AUDIO HEAD
H031(2/3) AUDIO ERASE HEAD
H031(3/3) CONTROL HEAD
CYLINDER DRIVE RELAY
PW01 (RED)
PG HEAD
M
CYLINDER MOTOR
1500 LOADING MOTOR
PI81 (BLK)
B556B LOADING MOTOR
RI02 DEW SENSOR
CAM SW RELAY
SI61 CAM SW
D
C
B
A
MECHA BASE MAIN
PI54
GND 1
CAM SW D 2
CAM SW C 3
CAM SW B 4
CAM SW A 5
WI54 (FFC)
CAPSTAN MOTOR RELAY
PI52
CAP CTL REF 1
CAP FG B 2
CAP CTL(ERROR) 3
LIMITER 4
CAPSTAN F/R 5
CAP FG A 6
ON/OFF +5V 7
CAPSTAN GND 8
CAPSTAN+B 9
IC GND 10
WI52 (FFC)
FG CAPSTAN
CAPSTAN MOTOR
FL
WI21
GND 1
START SENSOR 2
FL SW 3
PI21
QI21 START SENSOR
SI22 FL SW
PI51
PI53
SU REEL 1
SU REEL 2
SU REEL +B 3
END SENSOR 4
REC INH. SW 5
GND 6
WI53 (FFC)
MECHA BASE SUB
PI41
QI22 END SENSOR
SI25 REC INHIBIT SW
QI51 HALL SENSOR
DI61 TAPE END LED
QI41 HALL SENSOR
○:DIRECT CONNECTION
□:DIP CONNECTOR
:CONNECTOR
:SHIELD LINE

7. Block Diag

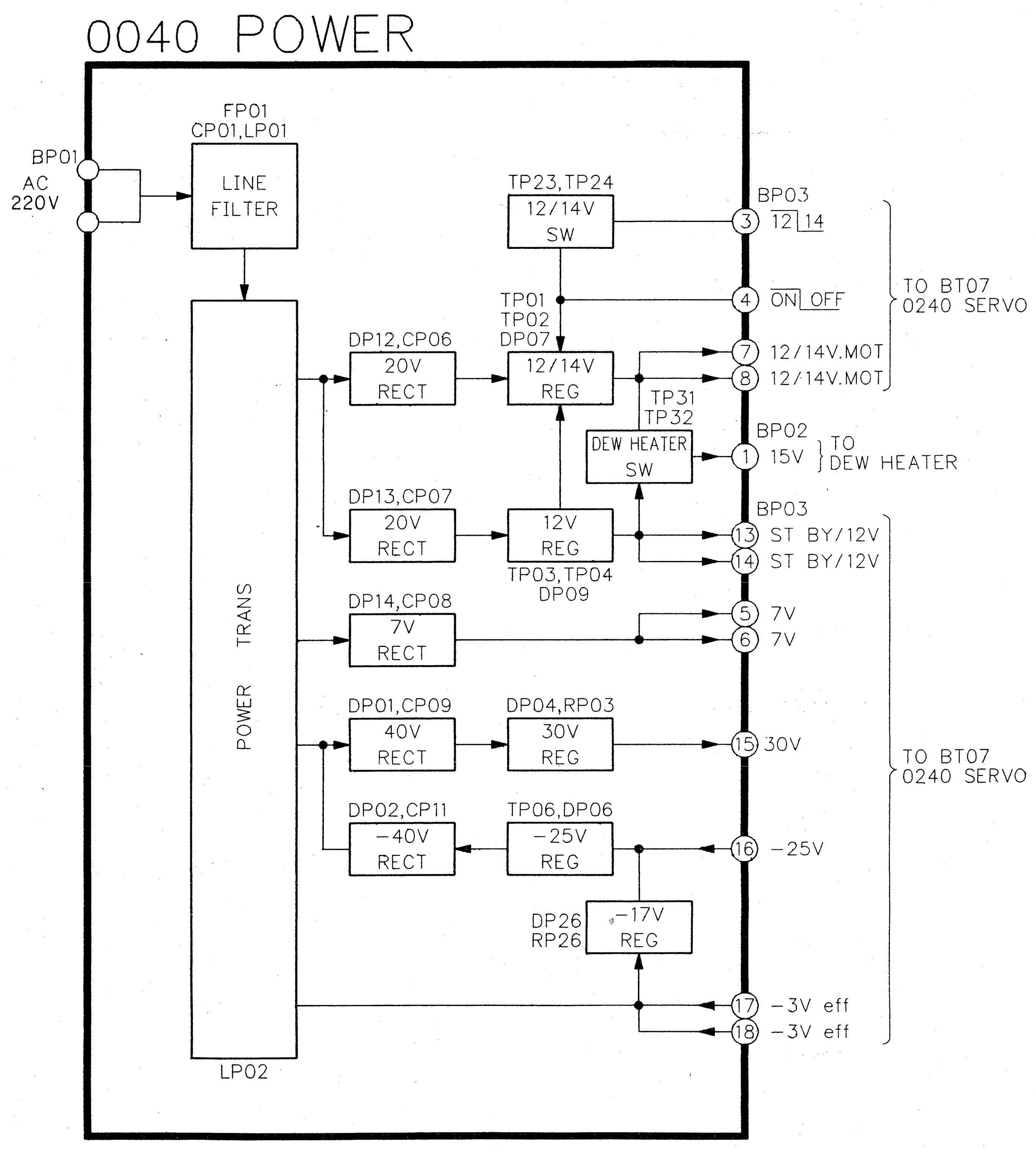
7-1. Power Supp


00
BP01
AC 220V

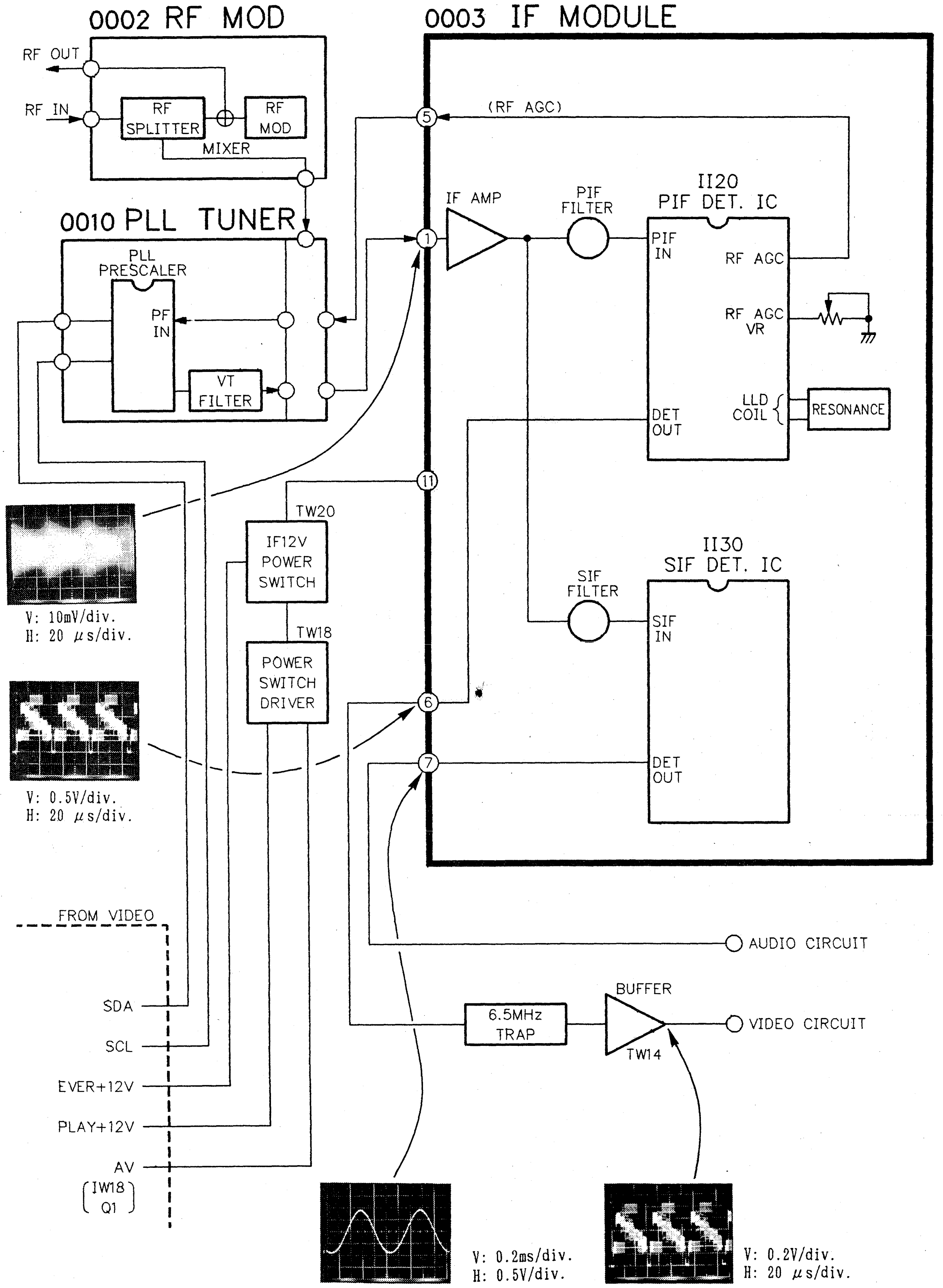

240 MAIN
0002 (RF MODULATOR)
ZF
0010 (TUNER)
EO/AUDIO)
(LOGIC/SERVO)
4000 PRE AMP
HEAD RELAY
ROTARY TRANSE
CH1
CH2
BF14 (BLK)
BB01 (BLK)
BB02 (BLK)
BB04
TEST CONNECTOR
BS02 (WHT)
H032 FULL WIDTH ERASE HEAD
ACE HEAD RELAY
BS01 (WHT)
BS03 (BLU)
H031(1/3) AUDIO HEAD
H031(2/3) AUDIO ERASE HEAD
H031(3/3) CONTROL HEAD
TEST CONNECTOR
BT06 (RED)
CYLINDER DRIVE RELAY
BT08 (RED)
PW01 (RED)
PG HEAD
CYLINDER MOTOR
1500 LOADING MOTOR
BT03 (BLK)
P181 (BLK)
B556B LOADING MOTOR
R102 DEW SENSOR
MECHA BASE MAIN
CAM SW RELAY
P154
W154 (FFC)
S161 CAM SW
CAPSTAN MOTOR RELAY
P152
W152 (FFC)
FG CAPSTAN
CAPSTAN MOTOR
FL
W121
P121
Q121 START SENSOR
S122 FL SW
BW22 (BLK)
BT01 (BLK)
BT04 (BLK)
BT07 (GRN)
P151
W601 (FFC)
P153
W153 (FFC)
MECHA BASE SUB
P141
Q122 END SENSOR
S125 REC INHIBIT SW
Q151 HALL SENSOR
D161 TAPE END LED
Q141 HALL SENSOR

7. Block Diagrams

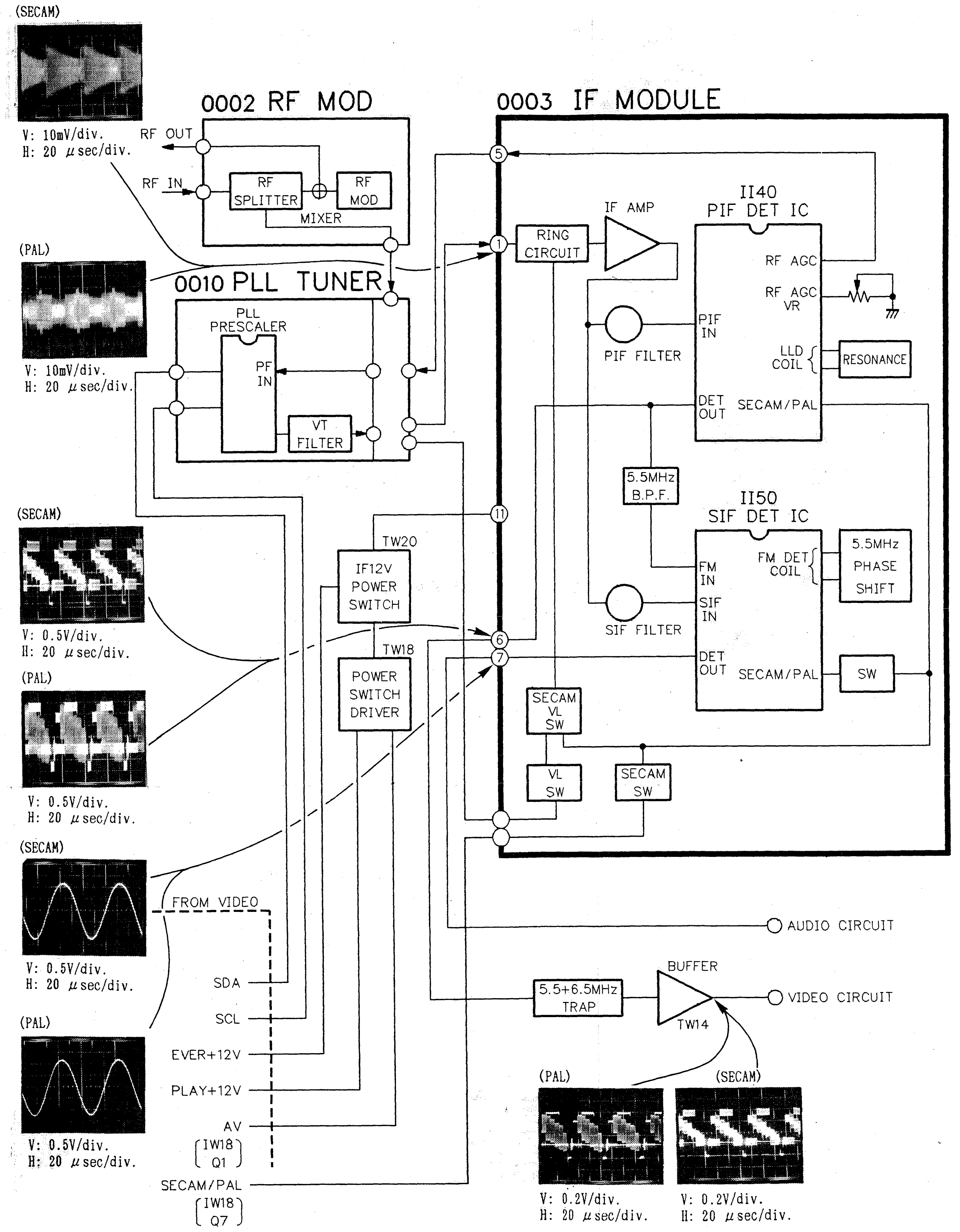
7-1. Power Supply Block Diagram


0040 POWER
BP01
AC 220V
FP01
CP01,LP01
LINE FILTER
POWER TRANS
LP02
TP23,TP24
12/14V SW
TP01
TP02
DP07
DP12,CP06
20V RECT
12/14V REG
TP31
TP32
DEW HEATER SW
DP13,CP07
20V RECT
12V REG
TP03,TP04
DP09
DP14,CP08
7V RECT
DP01,CP09
40V RECT
DP04,RP03
30V REG
DP02,CP11
−40V RECT
TP06,DP06
−25V REG
DP26
RP26
−17V REG
BP03
3 12|14
4 ON|OFF
7 12/14V.MOT
8 12/14V.MOT
TO BT07 0240 SERVO
BP02
1 15V
TO DEW HEATER
BP03
13 ST BY/12V
14 ST BY/12V
5 7V
6 7V
15 30V
16 −25V
17 −3V eff
18 −3V eff
TO BT07 0240 SERVO

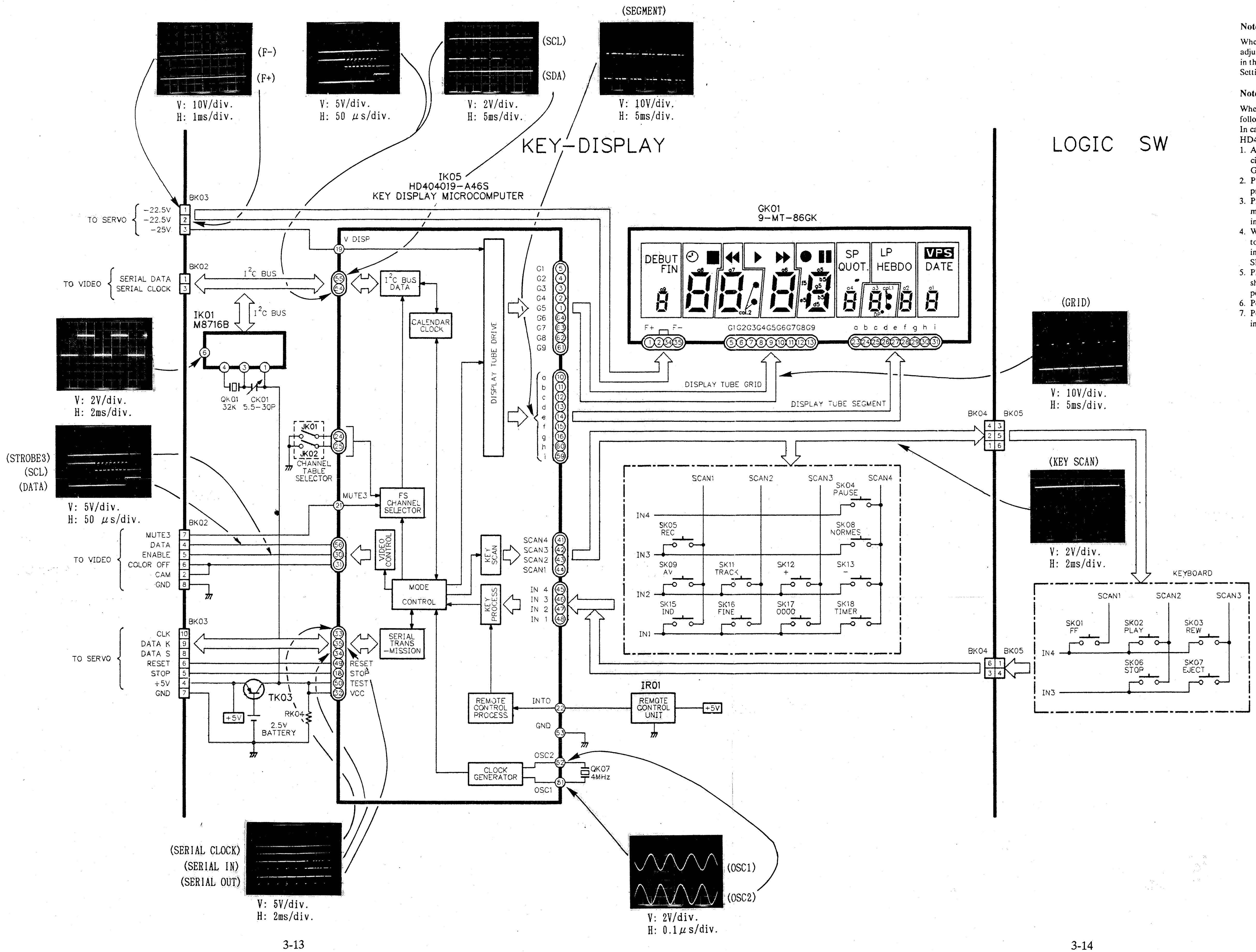
7-2-(1). PIF Block Diagram (V-110F, V-120F, V-130F)


0002 RF MOD
RF OUT
RF IN
RF SPLITTER
RF MOD
MIXER
0003 IF MODULE
(RF AGC)
5
0010 PLL TUNER
PLL PRESCALER
PF IN
VT FILTER
1
IF AMP
PIF FILTER
II20
PIF DET. IC
PIF IN
RF AGC
RF AGC VR
LLD COIL
RESONANCE
DET OUT
11
TW20
IF12V POWER SWITCH
TW18
POWER SWITCH DRIVER
II30
SIF DET. IC
SIF FILTER
SIF IN
DET OUT
6
7
V: 10mV/div.
H: 20 μs/div.
V: 0.5V/div.
H: 20 μs/div.
FROM VIDEO
SDA
SCL
EVER+12V
PLAY+12V
AV
IW18 Q1
AUDIO CIRCUIT
6.5MHz TRAP
BUFFER
TW14
VIDEO CIRCUIT
V: 0.2ms/div.
H: 0.5V/div.
V: 0.2V/div.
H: 20 μs/div.

7-2-(2). PIF Block Diagram (V-170F, V-180F)


(SECAM)
V: 10mV/div.
H: 20 μsec/div.
0002 RF MOD
RF OUT
RF IN
RF SPLITTER
RF MOD
MIXER
0003 IF MODULE
5
1
RING CIRCUIT
IF AMP
II40
PIF DET IC
RF AGC
RF AGC VR
PIF IN
PIF FILTER
LLD COIL
RESONANCE
DET OUT
SECAM/PAL
(PAL)
V: 10mV/div.
H: 20 μsec/div.
0010 PLL TUNER
PLL PRESCALER
PF IN
VT FILTER
5.5MHz B.P.F.
II50
SIF DET IC
FM IN
FM DET COIL
5.5MHz PHASE SHIFT
SIF IN
SIF FILTER
DET OUT
SECAM/PAL
SW
11
TW20
IF12V POWER SWITCH
TW18
POWER SWITCH DRIVER
6
7
SECAM VL SW
VL SW
SECAM SW
(SECAM)
V: 0.5V/div.
H: 20 μsec/div.
(PAL)
V: 0.5V/div.
H: 20 μsec/div.
(SECAM)
V: 0.5V/div.
H: 20 μsec/div.
(PAL)
V: 0.5V/div.
H: 20 μsec/div.
FROM VIDEO
SDA
SCL
EVER+12V
PLAY+12V
AV
IW18 Q1
SECAM/PAL
IW18 Q7
AUDIO CIRCUIT
5.5+6.5MHz TRAP
BUFFER
TW14
VIDEO CIRCUIT
(PAL)
(SECAM)
V: 0.2V/div.
H: 20 μsec/div.
V: 0.2V/div.
H: 20 μsec/div.

7-3. Key Display Block Diagram


(F-)
(F+)
V: 10V/div.
H: 1ms/div.
V: 5V/div.
H: 50 μs/div.
(SCL)
(SDA)
V: 2V/div.
H: 5ms/div.
(SEGMENT)
V: 10V/div.
H: 5ms/div.
KEY-DISPLAY
LOGIC SW
IK05
HD404019-A46S
KEY DISPLAY MICROCOMPUTER
BK03
TO SERVO
-22.5V
-22.5V
-25V
BK02
TO VIDEO
SERIAL DATA
SERIAL CLOCK
I²C BUS
IK01
M8716B
QK01
32K
CK01
5.5-30P
V: 2V/div.
H: 2ms/div.
(STROBE3)
(SCL)
(DATA)
V: 5V/div.
H: 50 μs/div.
JK01
JK02
CHANNEL TABLE SELECTOR
V DISP
I²C BUS DATA
CALENDAR CLOCK
DISPLAY TUBE DRIVE
G1
G2
G3
G4
G5
G6
G7
G8
G9
a
b
c
d
e
f
g
h
i
MUTE3
FS CHANNEL SELECTOR
VIDEO CONTROL
MODE CONTROL
KEY SCAN
KEY PROCESS
SCAN4
SCAN3
SCAN2
SCAN1
IN 4
IN 3
IN 2
IN 1
SERIAL TRANS -MISSION
REMOTE CONTROL PROCESS
CLOCK GENERATOR
INTO
GND
OSC2
OSC1
QK07
4MHz
IR01
REMOTE CONTROL UNIT
+5V
MUTE3
DATA
ENABLE
COLOR OFF
CAM
GND
CLK
DATA K
DATA S
RESET
STOP
+5V
GND
RESET
STOP
TEST
VCC
TK03
RK04
+5V
2.5V
BATTERY
GK01
9-MT-86GK
DEBUT
FIN
SP
QUOT.
LP
HEBDO
VPS
DATE
F+
F-
G1G2G3G4G5G6G7G8G9
a b c d e f g h i
DISPLAY TUBE GRID
DISPLAY TUBE SEGMENT
BK04
BK05
SCAN1
SCAN2
SCAN3
SCAN4
SK04
PAUSE
IN4
SK05
REC
SK08
NORMES
IN3
SK09
AV
SK11
TRACK
SK12
+
SK13
-
IN2
SK15
IND
SK16
FINE
SK17
0000
SK18
TIMER
IN1
(GRID)
V: 10V/div.
H: 5ms/div.
(KEY SCAN)
V: 2V/div.
H: 2ms/div.
KEYBOARD
SK01
FF
SK02
PLAY
SK03
REW
SK06
STOP
SK07
EJECT
(SERIAL CLOCK)
(SERIAL IN)
(SERIAL OUT)
V: 5V/div.
H: 2ms/div.
(OSC1)
(OSC2)
V: 2V/div.
H: 0.1μs/div.

Note: (V-110F/120F/130F)

When replacing IK05 or XK03, perform the adjustment according to the methods stated in the Servo Circuit (Head Switching Point Setting).

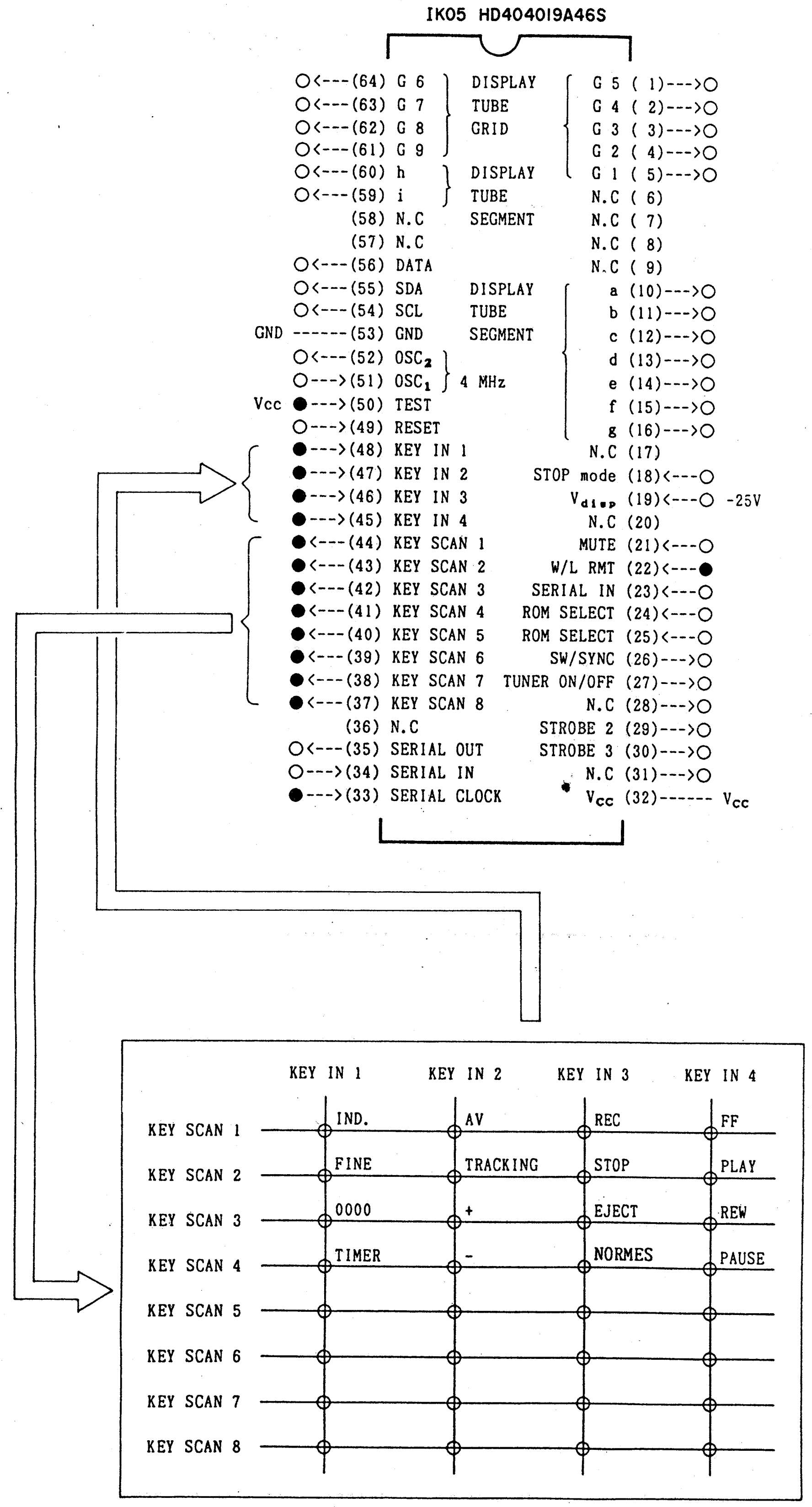
Note: (V-170F/180F)

When replacing IK05 or XK03, perform the following methods.
In case of replacing IK05, replace it with HD404019A63S. (Refer to parts list for SN.)

1. After replacing the part, make a short circuit between the pin 25 of IK05 and GND.
2. Plug the power cord into the outlet pressing both Timer key and (−) key.
3. Press the Tuner key of remote control to make ON mode. And make sure the indicator SP or LP lights.
4. When LP lights, the pin 3 of BK04 touches with the pin 5, then the indication switches to SP. By this contact, SP and LP are switched periodically.
5. Plug the power cord off and open the short-circuit between pin 3 and 5 of BK04 performed on item 1 above.
6. Perform same procedure as item 2 above.
7. Perform the Head Switching Point Setting in the Servo circuit.

Key Display Microcomputer Terminal Function

● --- ACTIVE Low
○ --- ACTIVE High

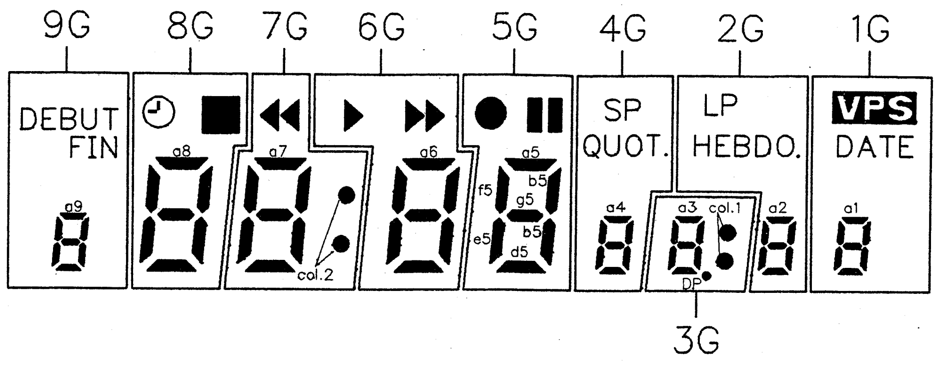


IK05 HD404019A46S

```
   ○<---(64) G 6  ⎫ DISPLAY     ⎧ G 5 ( 1)--->○
   ○<---(63) G 7  ⎬ TUBE        ⎪ G 4 ( 2)--->○
   ○<---(62) G 8  ⎪ GRID        ⎨ G 3 ( 3)--->○
   ○<---(61) G 9  ⎭             ⎪ G 2 ( 4)--->○
   ○<---(60) h    ⎫ DISPLAY     ⎩ G 1 ( 5)--->○
   ○<---(59) i    ⎭ TUBE          N.C ( 6)
        (58) N.C    SEGMENT       N.C ( 7)
        (57) N.C                  N.C ( 8)
   ○<---(56) DATA                 N.C ( 9)
   ○<---(55) SDA    DISPLAY     ⎧   a (10)--->○
   ○<---(54) SCL    TUBE        ⎪   b (11)--->○
GND ------(53) GND  SEGMENT     ⎪   c (12)--->○
   ○<---(52) OSC2 ⎫             ⎨   d (13)--->○
   ○--->(51) OSC1 ⎭ 4 MHz       ⎪   e (14)--->○
Vcc ●--->(50) TEST              ⎪   f (15)--->○
   ○--->(49) RESET              ⎩   g (16)--->○
   ●--->(48) KEY IN 1             N.C (17)
   ●--->(47) KEY IN 2       STOP mode (18)<---○
   ●--->(46) KEY IN 3           Vdisp (19)<---○  -25V
   ●--->(45) KEY IN 4             N.C (20)
   ●<---(44) KEY SCAN 1          MUTE (21)<---○
   ●<---(43) KEY SCAN 2        W/L RMT (22)<---●
   ●<---(42) KEY SCAN 3      SERIAL IN (23)<---○
   ●<---(41) KEY SCAN 4     ROM SELECT (24)<---○
   ●<---(40) KEY SCAN 5     ROM SELECT (25)<---○
   ●<---(39) KEY SCAN 6        SW/SYNC (26)--->○
   ●<---(38) KEY SCAN 7  TUNER ON/OFF (27)--->○
   ●<---(37) KEY SCAN 8            N.C (28)--->○
        (36) N.C              STROBE 2 (29)--->○
   ○<---(35) SERIAL OUT       STROBE 3 (30)--->○
   ○--->(34) SERIAL IN             N.C (31)--->○
   ●--->(33) SERIAL CLOCK          Vcc (32)------ Vcc
```

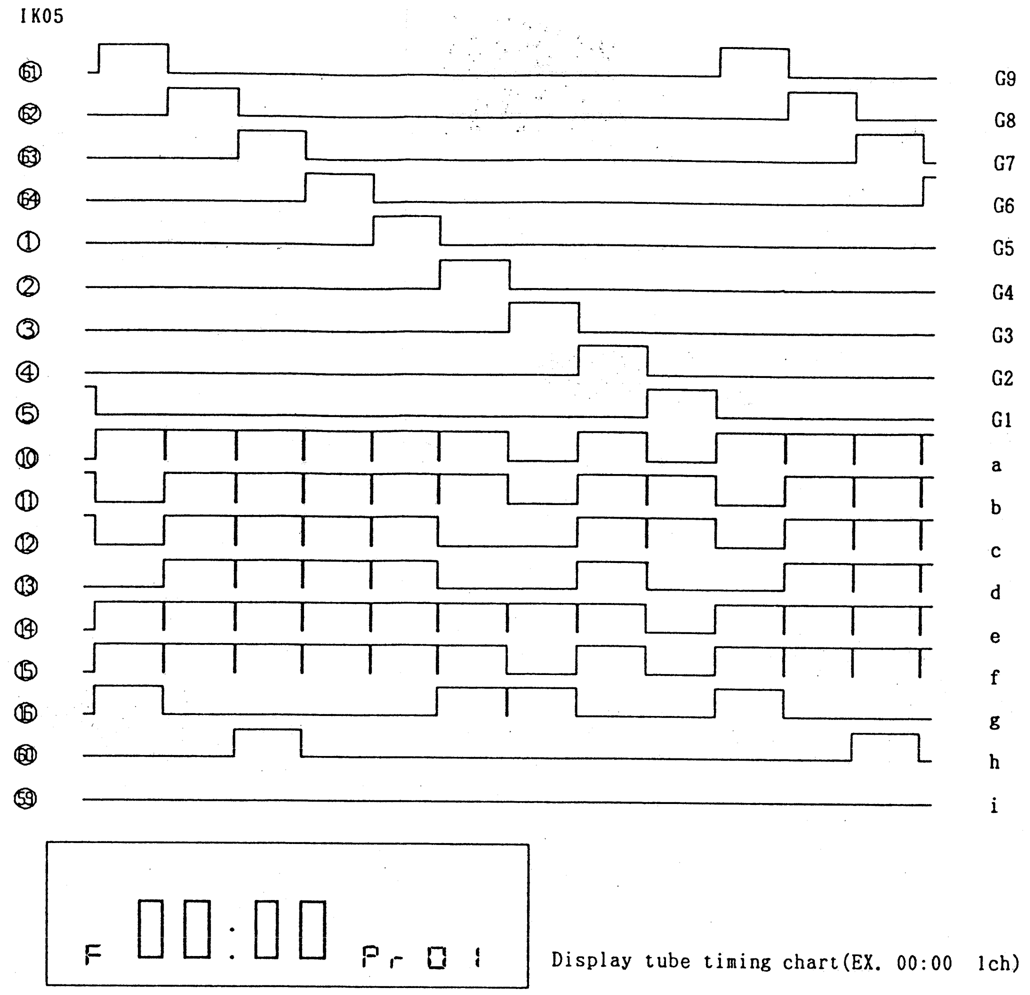
	KEY IN 1	KEY IN 2	KEY IN 3	KEY IN 4
KEY SCAN 1	IND.	AV	REC	FF
KEY SCAN 2	FINE	TRACKING	STOP	PLAY
KEY SCAN 3	0000	+	EJECT	REW
KEY SCAN 4	TIMER	-	NORMES	PAUSE
KEY SCAN 5				
KEY SCAN 6				
KEY SCAN 7				
KEY SCAN 8				

Key Display GK01 9-MT-86GK

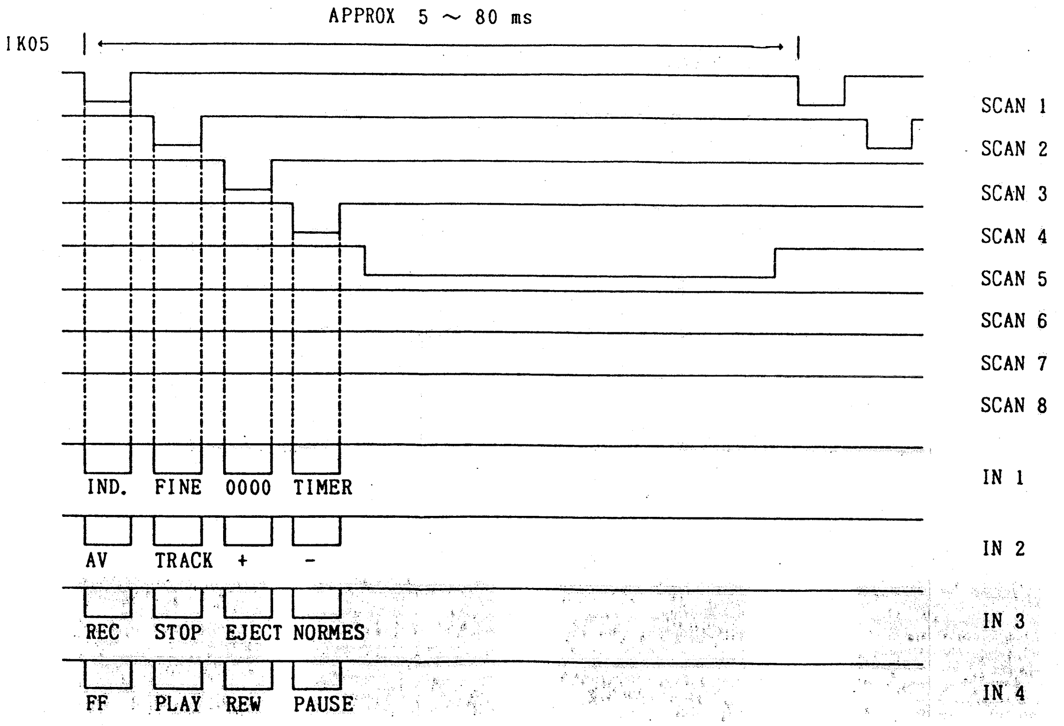


Key Display Pattern

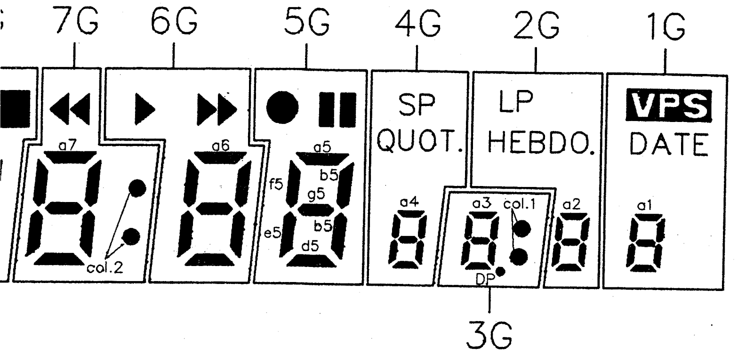
	9 G	8 G	7 G	6 G	5 G	4 G	3 G	2 G	1 G
a	a	a	a	a	a	a	a	a	a
b	b	b	b	b	b	b	b	b	b
c	c	c	c	c	c	c	c	c	c
d	d	d	d	d	d	d	d	d	d
e	e	e	e	e	e	e	e	e	e
f	f	f	f	f	f	f	f	f	f
g	g	g	g	g	g	g	g	g	g
h	FIN	🕘	cal, 2	▶▶	❚❚	QUOT.	col, 1	HEBDO.	DATE
i	DEBUT	■	◀◀	▶	●	SP	DP	LP	VPS



Display tube timing chart(EX. 00:00 1ch)

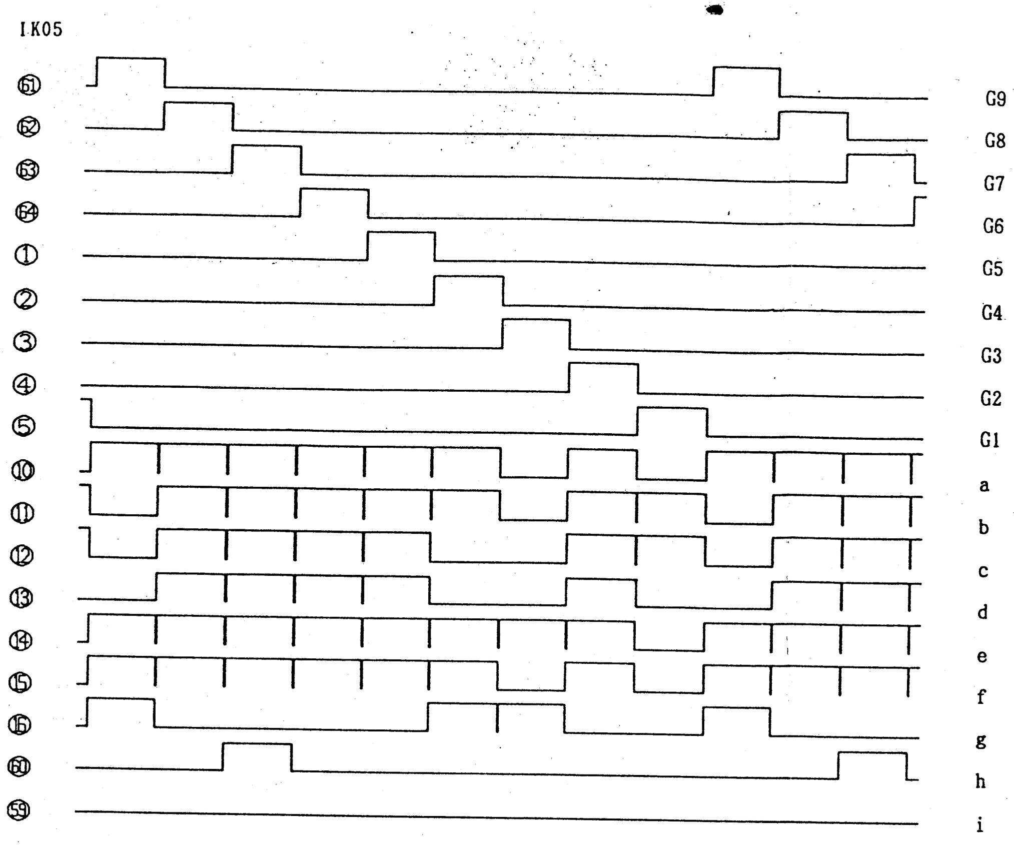


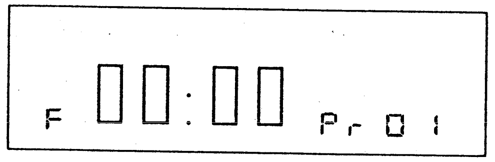
K01 9-MT-86GK


7G
6G
5G
4G
2G
1G
3G
SP
QUOT.
LP
HEBDO.
VPS
DATE
g7
g6
g5
f5
g5
b5
e5
b5
d5
col.2
a4
a3
col.1
a2
a1
DP

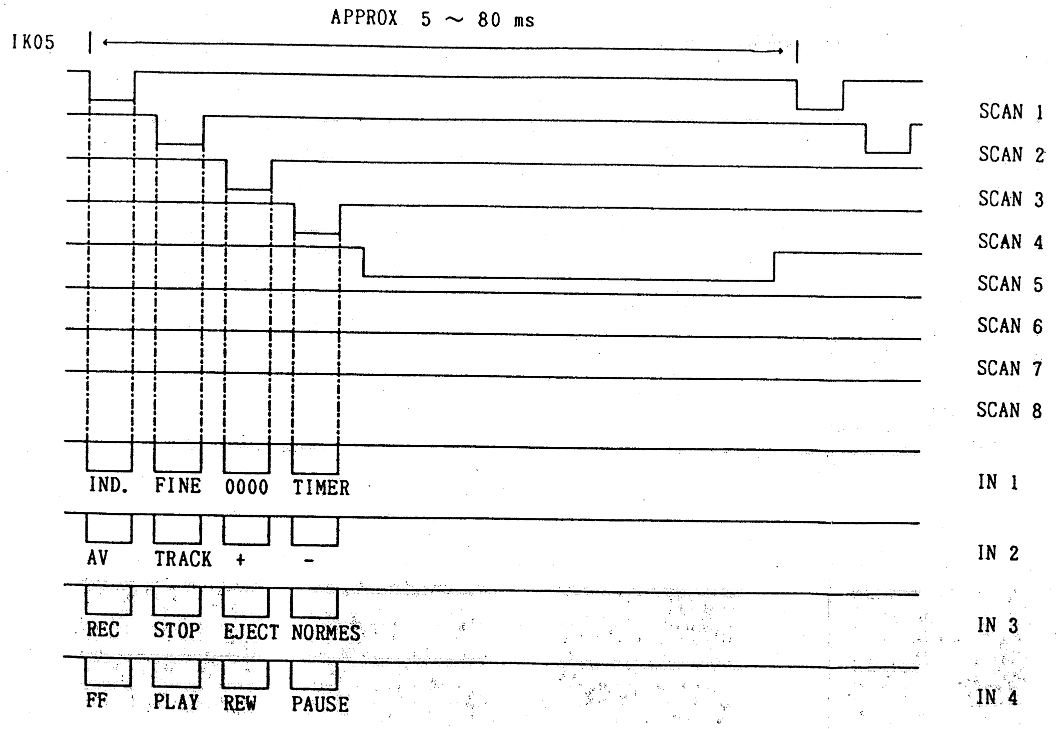
ttern

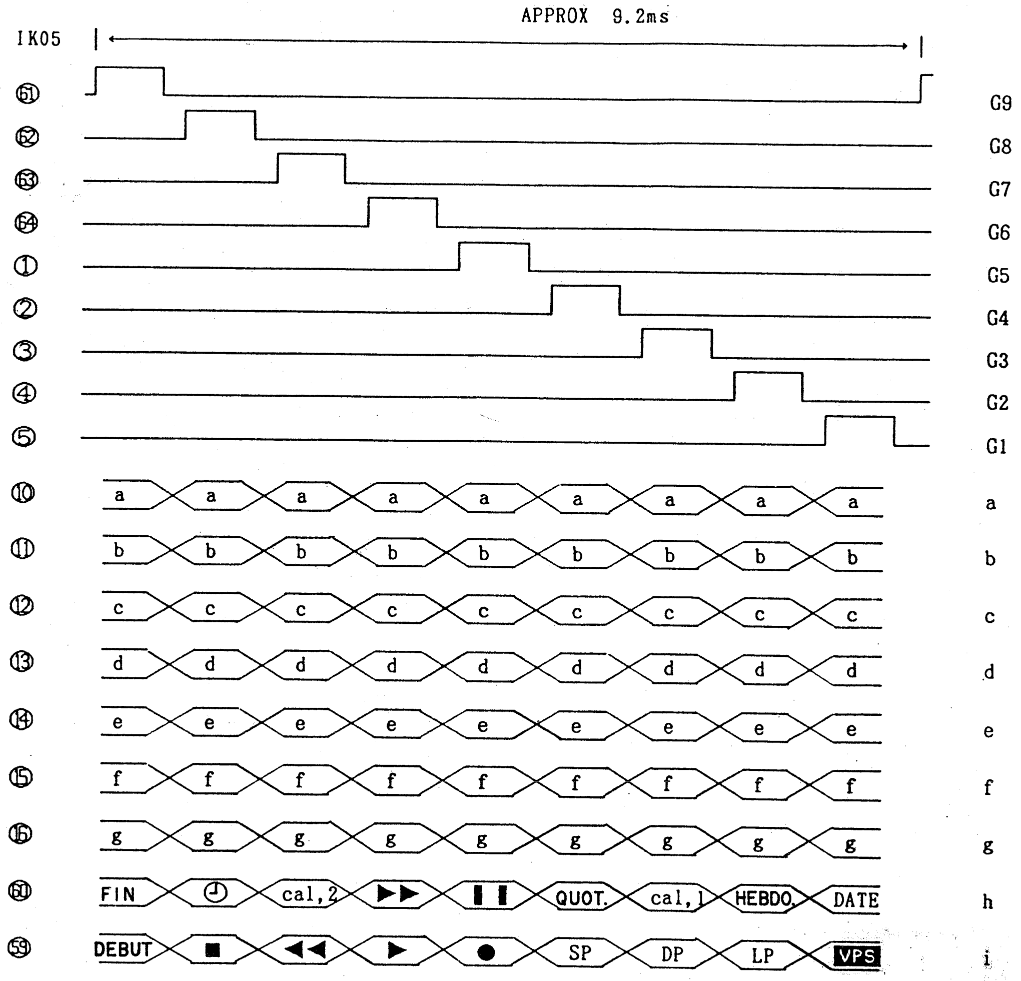
8 G	7 G	6 G	5 G	4 G	3 G	2 G	1 G
a	a	a	a	a	a	a	a
b	b	b	b	b	b	b	b
c	c	c	c	c	c	c	c
d	d	d	d	d	d	d	d
e	e	e	e	e	e	e	e
f	f	f	f	f	f	f	f
g	g	g	g	g	g	g	g
⊕	cal, 2	▶▶	❚❚	QUOT.	col, 1	HEBDO.	DATE
■	◀◀	▶	●	SP	DP	LP	VPS


IK05
(61)
(62)
(63)
(64)
①
②
③
④
⑤
⑩
⑪
⑫
⑬
⑭
⑮
⑯
(60)
(59)
G9
G8
G7
G6
G5
G4
G3
G2
G1
a
b
c
d
e
f
g
h
i

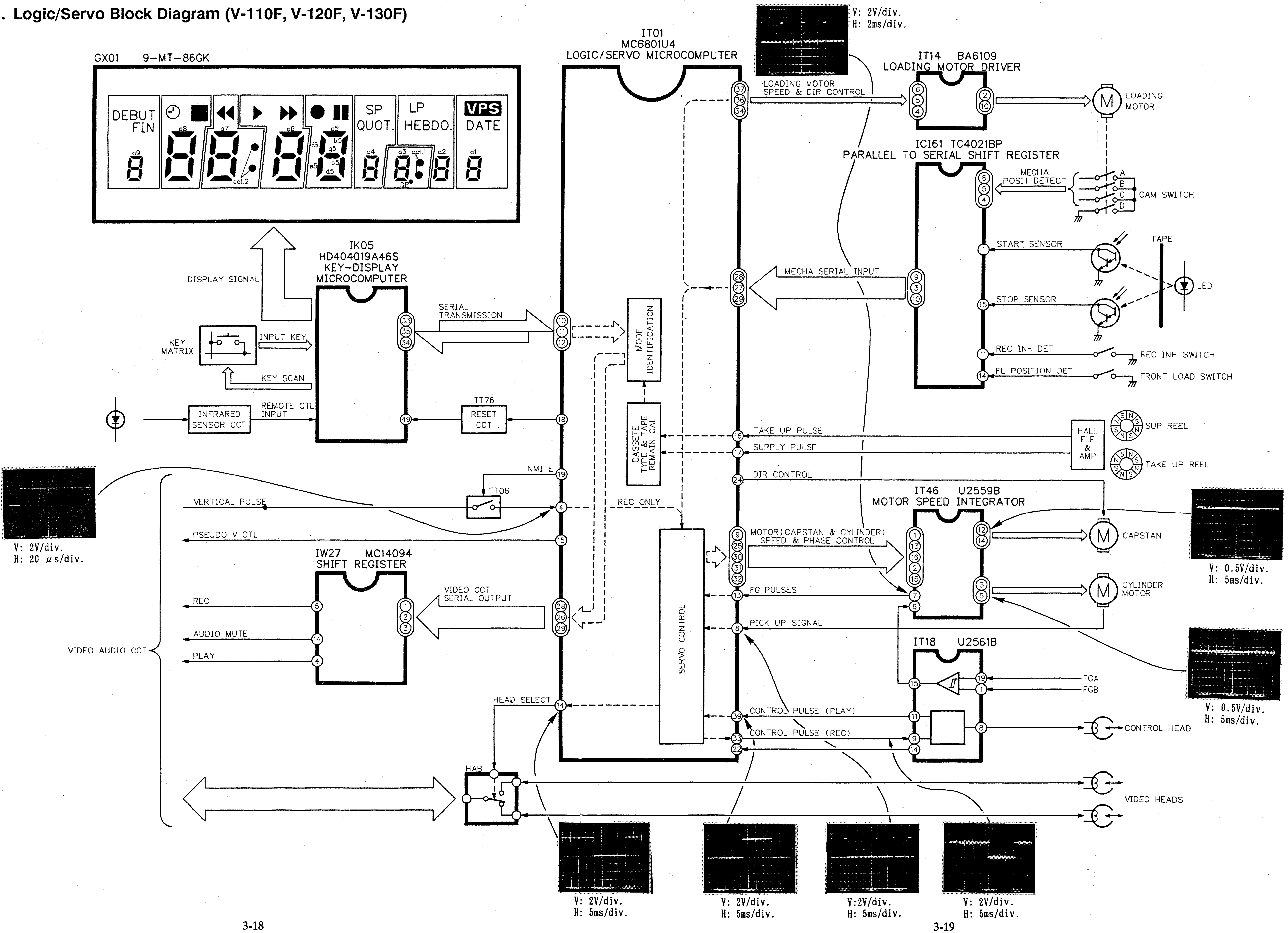


Display tube timing chart(EX. 00:00 1ch)


APPROX 5 ~ 80 ms
IK05
SCAN 1
SCAN 2
SCAN 3
SCAN 4
SCAN 5
SCAN 6
SCAN 7
SCAN 8
IND.
FINE
0000
TIMER
IN 1
AV
TRACK
+
-
IN 2
REC
STOP
EJECT
NORMES
IN 3
FF
PLAY
REW
PAUSE
IN 4


APPROX 9.2ms
IK05
(61)
(62)
(63)
(64)
①
②
③
④
⑤
⑩
⑪
⑫
⑬
⑭
⑮
⑯
(60)
(59)
G9
G8
G7
G6
G5
G4
G3
G2
G1
a
b
c
d
e
f
g
h
i
FIN
cal,2
▶▶
❚❚
QUOT.
cal,1
HEBDO.
DATE
DEBUT
■
◀◀
▶
●
SP
DP
LP
VPS

7-4-(1). Logic/Servo Block Diagram (V-110F, V-120F, V-130F)



GX01 9-MT-86GK
DEBUT
FIN
SP
QUOT.
LP
HEBDO.
VPS
DATE
IT01
MC6801U4
LOGIC/SERVO MICROCOMPUTER
IK05
HD404019A46S
KEY-DISPLAY
MICROCOMPUTER
DISPLAY SIGNAL
KEY MATRIX
INPUT KEY
KEY SCAN
INFRARED SENSOR CCT
REMOTE CTL INPUT
SERIAL TRANSMISSION
TT76
RESET CCT
MODE IDENTIFICATION
CASSETE TYPE & TAPE REMAIN CAL
NMI E
TT06
VERTICAL PULSE
PSEUDO V CTL
REC ONLY
IW27 MC14094
SHIFT REGISTER
VIDEO CCT SERIAL OUTPUT
REC
AUDIO MUTE
PLAY
VIDEO AUDIO CCT
HEAD SELECT
HAB
SERVO CONTROL
V: 2V/div.
H: 2ms/div.
IT14 BA6109
LOADING MOTOR DRIVER
LOADING MOTOR SPEED & DIR CONTROL
LOADING MOTOR
ICI61 TC4021BP
PARALLEL TO SERIAL SHIFT REGISTER
MECHA POSIT DETECT
A
B
C
D
CAM SWITCH
START SENSOR
STOP SENSOR
TAPE
LED
MECHA SERIAL INPUT
REC INH DET
REC INH SWITCH
FL POSITION DET
FRONT LOAD SWITCH
TAKE UP PULSE
SUPPLY PULSE
HALL ELE & AMP
SUP REEL
TAKE UP REEL
DIR CONTROL
IT46 U2559B
MOTOR SPEED INTEGRATOR
MOTOR (CAPSTAN & CYLINDER) SPEED & PHASE CONTROL
CAPSTAN
CYLINDER MOTOR
FG PULSES
PICK UP SIGNAL
IT18 U2561B
FGA
FGB
CONTROL PULSE (PLAY)
CONTROL PULSE (REC)
CONTROL HEAD
VIDEO HEADS
V: 2V/div.
H: 20 µs/div.
V: 0.5V/div.
H: 5ms/div.
V: 0.5V/div.
H: 5ms/div.
V: 2V/div.
H: 5ms/div.
V: 2V/div.
H: 5ms/div.
V:2V/div.
H: 5ms/div.
V: 2V/div.
H: 5ms/div.

SPEED REGULA

PI

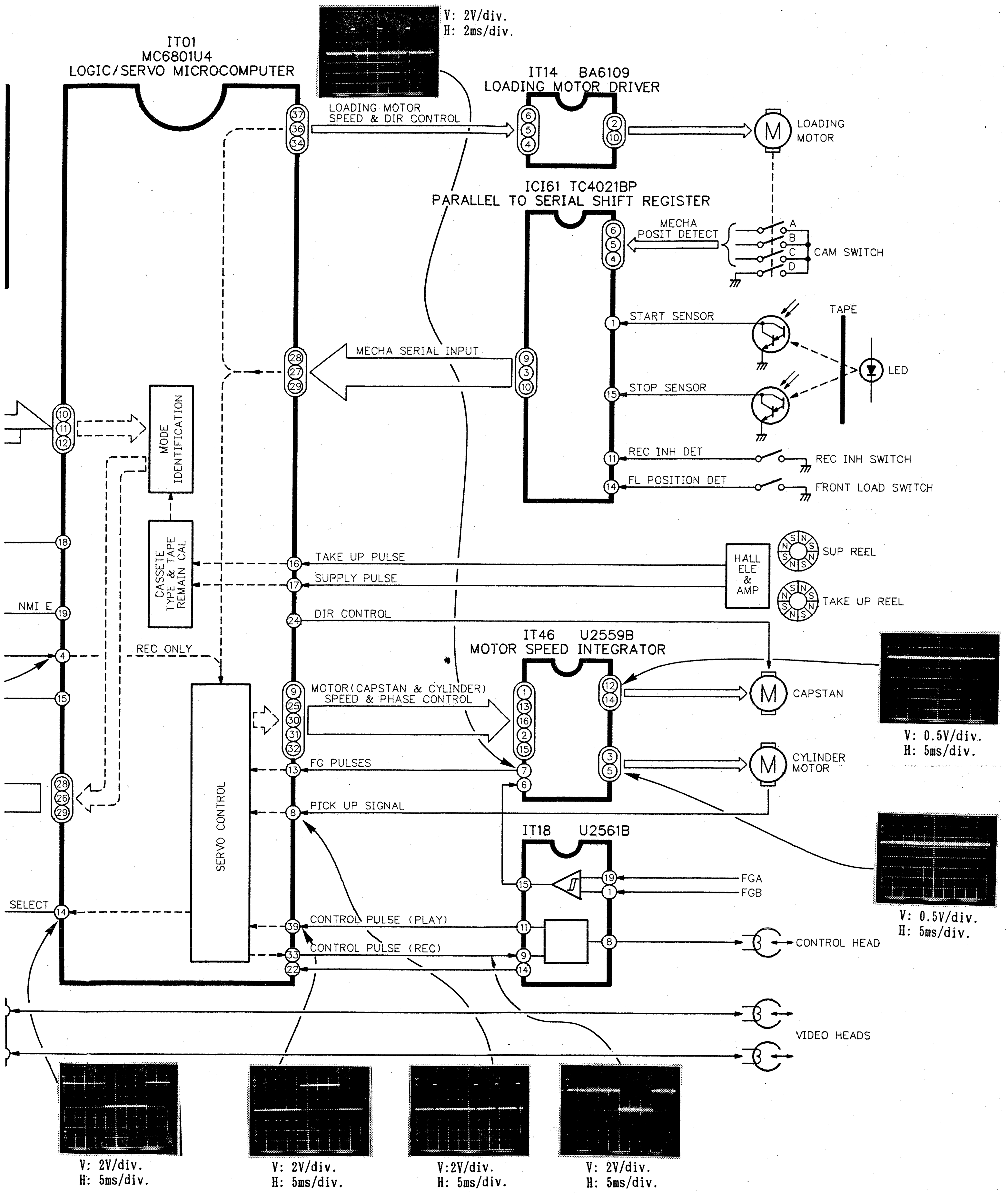
COUNTER SETT

PI

NOTE:

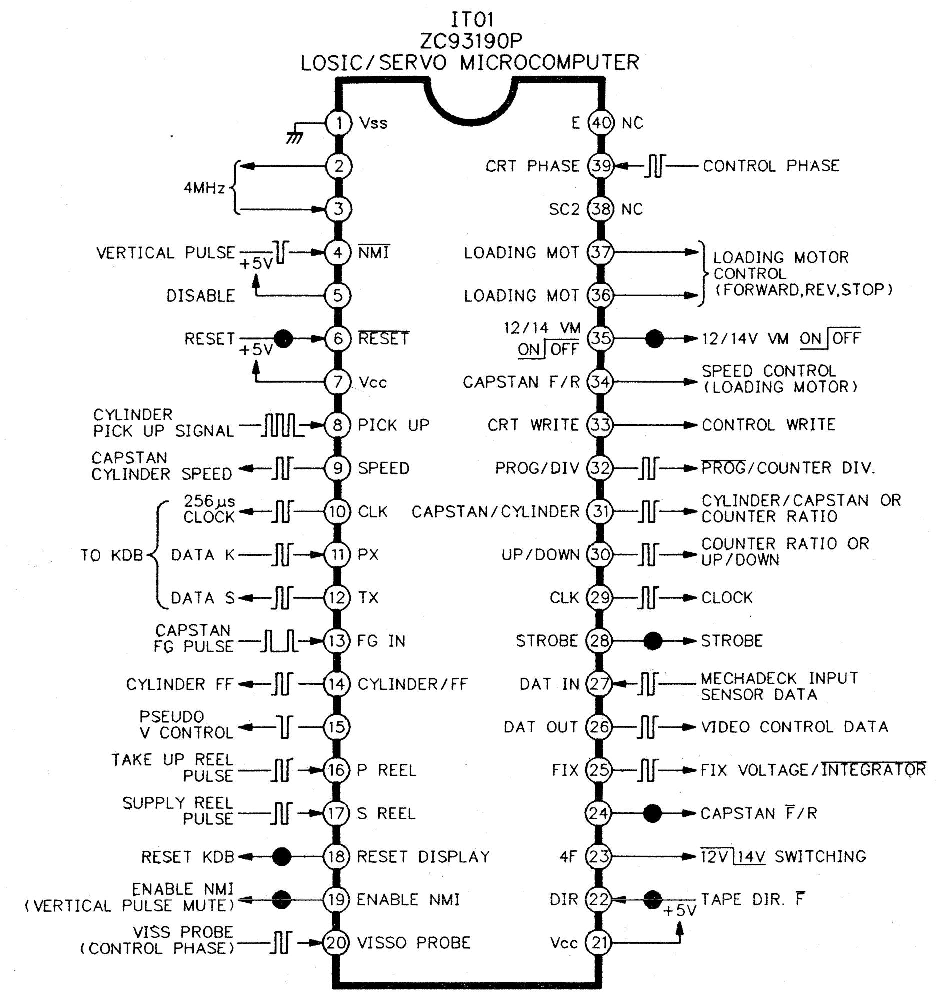
TO SET COUN

AFTER COUNT



IT01
MC6801U4
LOGIC/SERVO MICROCOMPUTER
V: 2V/div.
H: 2ms/div.
IT14 BA6109
LOADING MOTOR DRIVER
LOADING MOTOR
SPEED & DIR CONTROL
LOADING
MOTOR
ICI61 TC4021BP
PARALLEL TO SERIAL SHIFT REGISTER
MECHA
POSIT DETECT
CAM SWITCH
A
B
C
D
START SENSOR
TAPE
MECHA SERIAL INPUT
LED
STOP SENSOR
MODE
IDENTIFICATION
REC INH DET
REC INH SWITCH
FL POSITION DET
FRONT LOAD SWITCH
CASSETE
TYPE & TAPE
REMAIN CAL
TAKE UP PULSE
SUPPLY PULSE
HALL
ELE
&
AMP
SUP REEL
TAKE UP REEL
NMI E
DIR CONTROL
REC ONLY
IT46 U2559B
MOTOR SPEED INTEGRATOR
MOTOR(CAPSTAN & CYLINDER)
SPEED & PHASE CONTROL
CAPSTAN
V: 0.5V/div.
H: 5ms/div.
FG PULSES
CYLINDER
MOTOR
SERVO CONTROL
PICK UP SIGNAL
IT18 U2561B
FGA
FGB
SELECT
CONTROL PULSE (PLAY)
CONTROL PULSE (REC)
CONTROL HEAD
V: 0.5V/div.
H: 5ms/div.
VIDEO HEADS
V: 2V/div.
H: 5ms/div.
V: 2V/div.
H: 5ms/div.
V:2V/div.
H: 5ms/div.
V: 2V/div.
H: 5ms/div.

Logic/Servo Microcomputer Terminal Function



IT01
ZC93190P
LOSIC/SERVO MICROCOMPUTER
1 Vss
2
3
4MHz
VERTICAL PULSE +5V 4 NMI
DISABLE 5
RESET +5V 6 RESET
7 Vcc
CYLINDER PICK UP SIGNAL 8 PICK UP
CAPSTAN CYLINDER SPEED 9 SPEED
256µs CLOCK 10 CLK
TO KDB
DATA K 11 PX
DATA S 12 TX
CAPSTAN FG PULSE 13 FG IN
CYLINDER FF 14 CYLINDER/FF
PSEUDO V CONTROL 15
TAKE UP REEL PULSE 16 P REEL
SUPPLY REEL PULSE 17 S REEL
RESET KDB 18 RESET DISPLAY
ENABLE NMI (VERTICAL PULSE MUTE) 19 ENABLE NMI
VISS PROBE (CONTROL PHASE) 20 VISSO PROBE
E 40 NC
CRT PHASE 39 CONTROL PHASE
SC2 38 NC
LOADING MOT 37
LOADING MOT 36
LOADING MOTOR CONTROL (FORWARD,REV,STOP)
12/14 VM ON OFF 35 12/14V VM ON OFF
CAPSTAN F/R 34 SPEED CONTROL (LOADING MOTOR)
CRT WRITE 33 CONTROL WRITE
PROG/DIV 32 PROG/COUNTER DIV.
CAPSTAN/CYLINDER 31 CYLINDER/CAPSTAN OR COUNTER RATIO
UP/DOWN 30 COUNTER RATIO OR UP/DOWN
CLK 29 CLOCK
STROBE 28 STROBE
DAT IN 27 MECHADECK INPUT SENSOR DATA
DAT OUT 26 VIDEO CONTROL DATA
FIX 25 FIX VOLTAGE/INTEGRATOR
24 CAPSTAN F/R
4F 23 12V 14V SWITCHING
DIR 22 +5V TAPE DIR. F
Vcc 21

IT46 (U2559B) Operation Data

SPEED REGULATION

PIN 1	PIN 2	PIN 15	PIN 16	
H	H	L	H	Pin 5 voltage increase.
H	H	L	L	Pin 5 voltage decrease.
H	L	L	H	Pin 12 voltage increase.
H	L	L	L	Pin 12 voltage decrease.

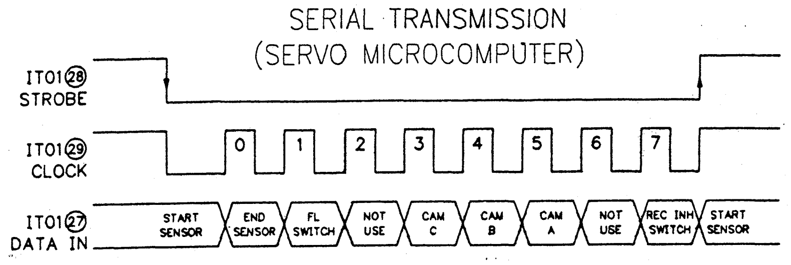
COUNTER SETTING RATIO FOR DIFFERENT MODE SPEED

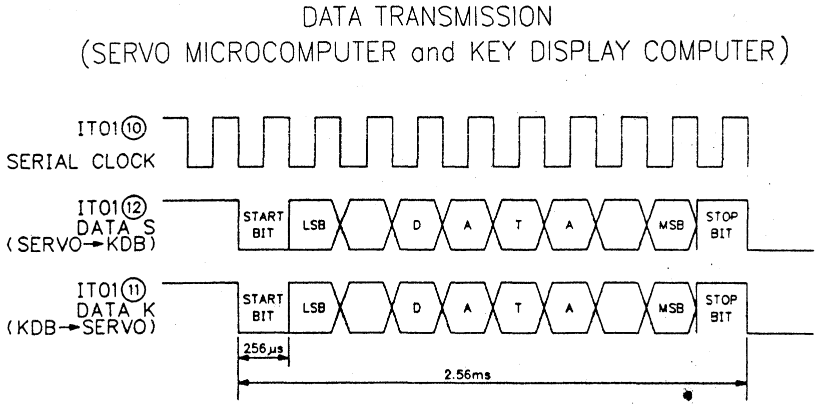
PIN 1	PIN 2	PIN 15	PIN 16		COUNTER RATIO
L	L	H	L	LONG PLAY	1 : 1
L	H	H	L	STANDARD PLAY	1 : 2
L	L	H	H	SEARCH	1 : 4
L	H	H	H	FF/REW	1 : 8

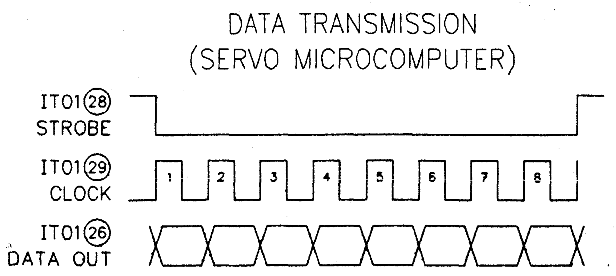
NOTE:

TO SET COUNTER RATIO :	PIN 1 MUST BE "L". PIN 15 MUST BE "H".
AFTER COUNTER RATIO IS SET :	PIN 15 GOES "L", COUNTER RATIO REMAINS PIN 1 GOES "H" TO REG. SPEED.

Serial Transmission (V-110F, V-120F, V-130F)


SERIAL TRANSMISSION
(SERVO MICROCOMPUTER)
IT01㉘ STROBE
IT01㉙ CLOCK
0
1
2
3
4
5
6
7
IT01㉗ DATA IN
START SENSOR
END SENSOR
FL SWITCH
NOT USE
CAM C
CAM B
CAM A
NOT USE
REC INH SWITCH
START SENSOR

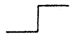

DATA TRANSMISSION
(SERVO MICROCOMPUTER and KEY DISPLAY COMPUTER)
IT01⑩ SERIAL CLOCK
IT01⑫ DATA S (SERVO→KDB)
IT01⑪ DATA K (KDB→SERVO)
START BIT
LSB
D
A
T
A
MSB
STOP BIT
256µs
2.56ms


DATA TRANSMISSION
(SERVO MICROCOMPUTER)
IT01㉘ STROBE
IT01㉙ CLOCK
1
2
3
4
5
6
7
8
IT01㉖ DATA OUT

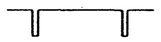
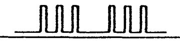
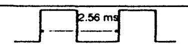
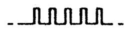
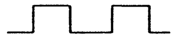
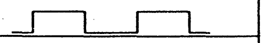
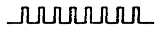
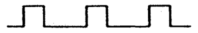
Logic/Servo Mode Shift Table (V-110F, V-120F, V-130F)

ECHO DATA	Operation key							
	STOP	EJECT	REW	PLAY	FF	PAUSE	REC	TIMER
ON	STOP	EJECT	REW	PLAY	FF	STILL	REC PAUSE	O
EJECT	X	X	X	X	X	X	X	X
PLAY	STOP	EJECT	Sr-5	PLAY	Sr 5	STILL	REC PAUSE	X
REW	STOP	EJECT	REW	PLAY	FF	STILL	REC PAUSE	X
FF	STOP	EJECT	REW	PLAY	FF	STILL	REC PAUSE	X
REC	STOP	EJECT	X	X	X	REC PAUSE	QUICK	X
QUICK REC	STOP	EJECT	X	REC	X	REC PAUSE	QUICK	X
STILL	STOP	EJECT	Sr-5	PLAY	Sr 5	FRAME ADVANCE	REC PAUSE	x
REC PAUSE	STOP	EJECT	X	REC	X	X	QUICK	X
Sr 5	STOP	EJECT	Sr 3	PLAY	Sr 7	STILL	REC PAUSE	X
Sr-5	STOP	EJECT	Sr-7	PLAY	Sr-3	STILL	REC PAUSE	X
Sr 7	STOP	EJECT	Sr 5	PLAY	Sr 9	STILL	REC PAUSE	X
Sr-7	STOP	EJECT	Sr-9	PLAY	Sr-5	STILL	REC PAUSE	X
Sr 9	STOP	EJECT	Sr 7	PLAY	Sr 8	STILL	REC PAUSE	X
Sr-9	STOP	EJECT	Sr-9	PLAY	Sr-7	STILL	REC PAUSE	X
Sr 3	STOP	EJECT	Sr 1	PLAY	Sr 5	STILL	REC PAUSE	X
Sr-3	STOP	EJECT	Sr-5	PLAY	Sr-1	STILL	REC PAUSE	X
Sr 1	STOP	EJECT	Sr-1	PLAY	Sr 3	STILL	REC PAUSE	X
Sr-1	STOP	EJECT	Sr-3	PLAY	Sr 1	STILL	REC PAUSE	X

IT01 (MC6801U4) Output Polarity (V-110F, V-120F, V-130F)

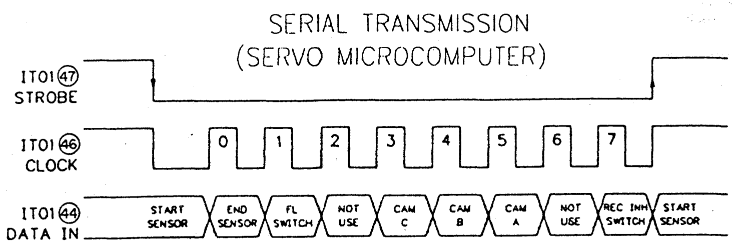
PIN	ACTIVE	SLOT IN	SLOT OUT	LOAD-ING	UN-LOADING	STOP	FF	REW	CUE	REV	PLAY	STILL	REC	REC PAUSE	REMARK
19 ENABLE NM1	L	H	H	H	H	H	H	H	H	H	H	H	L	L	
22 DIR F/R	L	H	H	L	H	H	L	H	L	H	L	H	L	H	
23 12V/14V	-	L	L	H	L	L	L	L	L	H	H	H	H	H	
24 CAPSTAN F/R	L	L	H	L	H	L	L	H	L	H	L	L	L	L	
33 CTL WRITE	-	L	L	L	L	L	L	L	L	L	L	L		L	
35 12/14V ON/OFF	L	L	L	L	L	L	L	L	L	L	L	L	L	L	Hi - when standby, emergency stop mode.

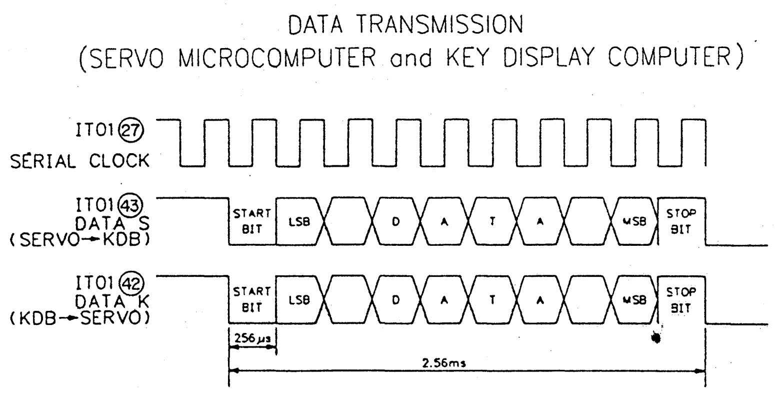
IT01 (MC6801U4) Pin Description (V-110F, V-120F, V-130F)

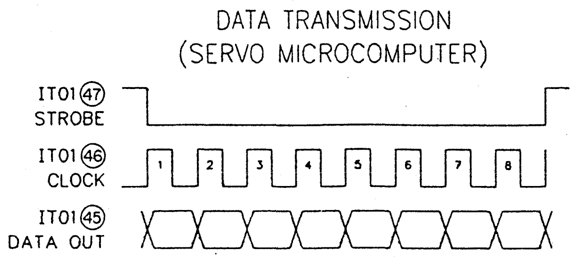
Pin No.	Mode	Description	Waveform
4	NMI	Vertical pulse (Interrupt the microprocessor every 2.56 ms)	
6	RESET	Resetting servo µP during power up (Generated by pin 8, IT46)	
8	PICKUP SIG	Signal pickup by the drum	
9	CAPSTAN & DRUM SPEED	Controlling the speed of capstan & drum	
10	CLOCK	Synchronising clock from servo µP to KDB	
11	DATA K	Data transmission from KDB to servo µP	
12	DATA S	Data transmission from servo µP to KDB	
13	CAPSTAN FG PULSE	Signal pickup from the capstan	
14	DRUM FF	Control the switching of video heads	
15	PSEUDO V CTL	Generated vert. control pulse during PAUSE, SEARCH, REV	
16	TAKE UP REEL PULSE	Signal indicating the speed of take up reel	
17	SUPPLY REEL PULSE	Signal indicating the speed of supply reel	
18	RESET KDB	Resetting the KDB µP (Active LOW)	
19	ENABLE NMI	To enable the NMI (Active LOW)	
20	VISS PROBE	Detect the "H" signal	
22	TAPE DIR	Signal determine direction of tape	Lo - Forward direction (PLAY, CUE, FF, etc.) Hi - Reverse direction (REV, REW, etc.)
23	12V/14V SW	Select 12V or 14V from power supply	Hi - 12V Lo - 14V
24	CAPSTAN F/R	Signal indicating capstan rotating direction	Forward - Lo Reverse - Hi
25	FIX VOLTAGE/IN-TEGRATOR	Select the function of motor speed integrator	Hi - Fix voltage mode Lo - Integrator mo de26
	VIDEO CTL DATA	Data sending to video (IW27) CCT det audio mute, PLAY, REC	Transmission control by strobe (#28) & clock (#29)
27	MECHADECK INPUT SENSOR DATA	Data received from mechadeck (ICI61) input sensor	
28	STROBE	Enable input (#27) & output (#26) data transmission	(Active Low)
29	CLOCK	Clocking data in & out of servo µP	
30	COUNTER RATIO OR UP/DOWN	In prog mode, determine charge & discharge In counter mode, determine the counter ratio	
31	DRUM/CAPSTAN OR COUNTER RATIO	In prog. mode, select drum or capstan funct In counter mode, determine the counter ratio	
32	PROG/COUNTER DIV	Select prog. or counter div of motor speed integrator	Hi - Enable counter div. Lo - Prog, charging & discharge
33	CTL WRITE	Control the read or write JOY control head	Hi - REC – Lo - No REC – Lo
34	SPEED CTL	Select the speed control for loading motor	Hi - Select 12V Lo - Select 11V
35	12/14V VM ON/OFF	Switching on or off 12V/14V from power supply	Hi - Turn off Lo - Turn on
36 37	LOADING MOTOR CTL	Control direction & movement of loading motor	#36 #37 Motor 0 0 STOP 0 1 CLOCKWISE 1 0 ANTI-CLOCKWISE
39	CTL PHASE	Control pulse pickup by control head from tape	

7-4-(2). Logic/Servo Block Diagram (V-170F, V-180F)

Serial Transmission (V-170F, V-180F)



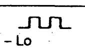
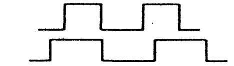
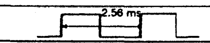
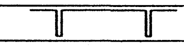




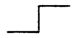
Logic/Servo Mode Shift Table (V-170F, V-180F)

ECHO DATA	Operation key								
	STOP	EJECT	REW	PLAY	FF	PAUSE	REC	TIMER	SLOW
ON	STOP	EJECT	REW	PLAY	FF	STILL	REC PAUSE	O	X
EJECT	X	X	X	X	X	X	X	X	X
PLAY	STOP	EJECT	Sr-5	PLAY	Sr 5	STILL	REC PAUSE	X	SLOW 1/8
REW	STOP	EJECT	REW	PLAY	FF	STILL	REC PAUSE	X	X
FF	STOP	EJECT	REW	PLAY	FF	STILL	REC PAUSE	X	X
REC	STOP	EJECT	X	X	X	REC PAUSE	QUICK	X	X
QUICK REC	STOP	EJECT	X	REC	X	REC PAUSE	QUICK	X	X
STILL	STOP	EJECT	Sr-5	PLAY	Sr 5	FRAME ADVANCE	REC PAUSE	x	SLOW 1/8
REC PAUSE	STOP	EJECT	X	REC	X	X	QUICK	X	X
Sr 5	STOP	EJECT	Sr 3	PLAY	Sr 7	STILL	REC PAUSE	X	X
Sr-5	STOP	EJECT	Sr-7	PLAY	Sr-3	STILL	REC PAUSE	X	X
Sr 7	STOP	EJECT	Sr 5	PLAY	Sr 9	STILL	REC PAUSE	X	X
Sr-7	STOP	EJECT	Sr-9	PLAY	Sr-5	STILL	REC PAUSE	X	X
Sr 9	STOP	EJECT	Sr 7	PLAY	Sr 8	STILL	REC PAUSE	X	X
Sr-9	STOP	EJECT	Sr-9	PLAY	Sr-7	STILL	REC PAUSE	X	X
Sr 3	STOP	EJECT	Sr 1	PLAY	Sr 5	STILL	REC PAUSE	X	X
Sr-3	STOP	EJECT	Sr-5	PLAY	Sr-1	STILL	REC PAUSE	X	X
Sr 1	STOP	EJECT	Sr-1	PLAY	Sr 3	STILL	REC PAUSE	X	X
Sr-1	STOP	EJECT	Sr-3	PLAY	Sr 1	STILL	REC PAUSE	X	X
SL 1/4	STOP	EJECT	SL 1/8	PLAY	SL 1/4	STILL	REC PAUSE	X	SLOW 1/8
SL 1/8	STOP	EJECT	SL 1/16	PLAY	SL 1/4	STILL	REC PAUSE	X	SLOW 1/8
SL 1/16	STOP	EJECT	SL 1/16	PLAY	SL 1/8	STILL	REC PAUSE	X	SLOW 1/8

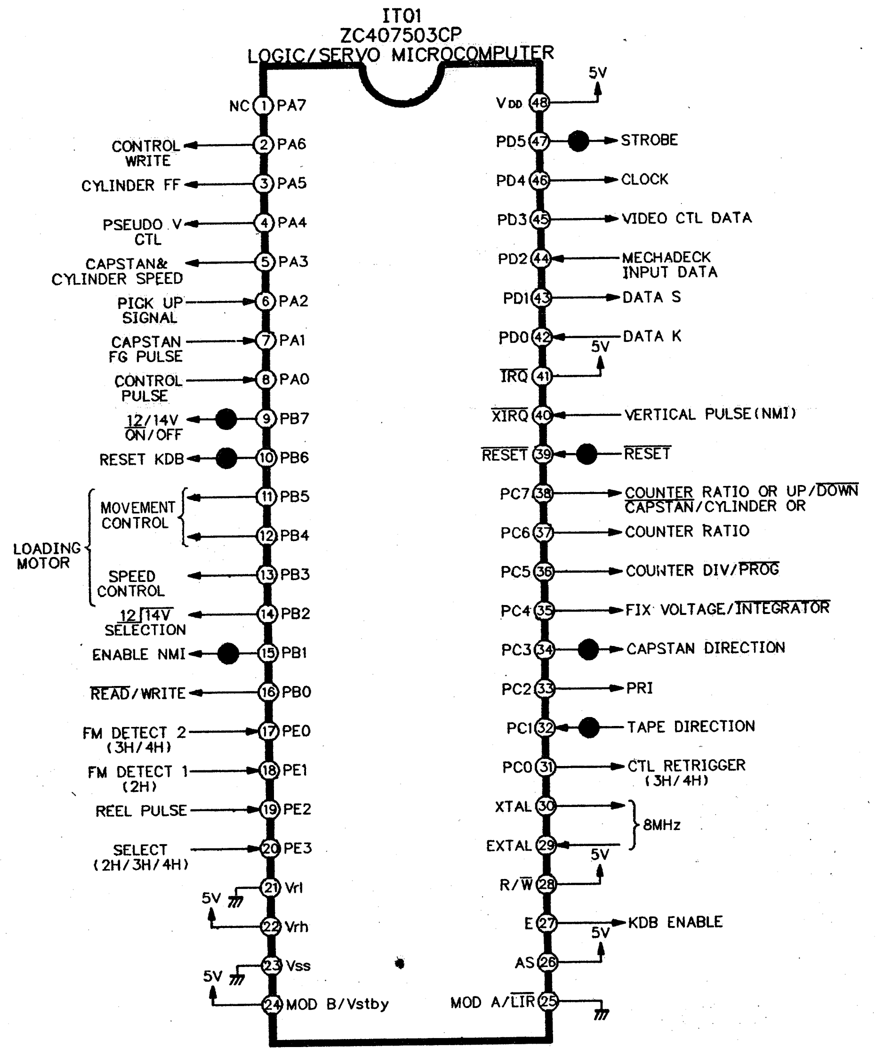
IT01 (ZC407503CP) Pin Description (V-170F, V-180F)

Pin No.	Mode	Description	Waveform
2	CTL WRITE	Control the read or write JOY control head	Hi - REC –  Lo - No REC – Lo
3	DRUM FF	Control the switching of video heads	
4	PSEUDO V CTL	Generated vert. control pulse during PAUSE, SEARCH, REV	
5	CAPSTAN & DRUM SPEED	Controlling the speed of capstan & drum	
6	PICKUP SIG	Signal pickup by the drum	
7	CAPSTAN FG PULSE	Signal pickup from the capstan	
8	CTL PHASE	Control pulse pickup by control head from tape	
9	12/14V VM ON/OFF	Switching on or off 12V/14V from power supply	Hi - Turn off Lo - Turn on
10	RESET KDB	Resetting the KDB μP (Active LOW)	Active Low
11 12	LOADING MOTOR CTL	Control direction & movement of loading motor	#11 #12 Motor 0 0 STOP 0 1 CLOCKWISE 1 0 ANTI-CLOCKWISE
13	SPEED CTL	Select the speed control for loading motor	Hi - Select 12V Lo - Select 11V
14	12V/14V SW	Select 12V or 14V from power supply	Hi - 14V Lo - 12V
15	ENABLE NMI	To enable the NMI (Active LOW)	
16	$\overline{\text{READ}}$/WRITE	Control the read or write for control head	Hi- REC Lo- NO REC
17	FM DETECT 2 (3H/4H)	Control tape position during still and slow	
18	FM DETECT 1 (2H)		
19	TAKE UP REEL PULSE SUPPLY REEL PULSE	Signal indicating the speed of take up reel Signal indicating the speed of supply reel	
20	SELECT (2H/3H/4H)	Selects video head type	
23	PRI		
27	CLOCK	Synchronizing clock from servo μP to KDB	
31	CTL RETRIGGER	Regenerates control pulse during slow	
32	TAPE DIR	Signal determine direction of tape	Lo - Forward direction (PLAY, CUE, FF, etc.) Hi - Reverse direction (REV, REW, etc.)
34	CAPSTAN F/R	Signal indicating capstan rotating direction	Forward - Lo Reverse - Hi
35	FIX VOLTAGE/INTEGRATOR	Select the function of motor speed integrator	Hi - Fix voltage mode Lo - Integrator mode
36	PROG/COUNTER DIV	Select prog. or counter div of motor speed integrator	Hi - Enable counter div. Lo - Prog, charging & discharge
37	DRUM/CAPSTAN OR COUNTER RATIO	In prog. mode, select drum or capstan funct In counter mode, determine the counter ratio	
38	COUNTER RATIO OR UP/DOWN	In prog mode, determine charge & discharge In counter mode, determine the counter ratio	
39	$\overline{\text{RESET}}$	Resetting servo μP during power up (Generated by pin 8, IT46)	
40	$\overline{\text{NMI}}$	Vertical pulse (Interrupt the microprocessor every 2.56 ms)	
42	DATA K	Data transmission from KDB to servo μP	
43	DATA S	Data transmission from servo μP to KDB	
44	MECHADECK INPUT SENSOR DATA	Data received from mechadeck (ICI61) input sensor	
45	VIDEO CTL DATA	Data sending to video (IW27) CCT det audio mute, PLAY, REC	Transmission control by strobe (#28) & clock (#29)
46	CLOCK	Clocking data in & out of servo μP	
47	STROBE	Enable input (#27) & output (#26) data transmission	(Active Low)

IT01 (ZC407503CP) Output Polarity (V-170F, V-180F)

PIN	ACTIVE	SLOT IN	SLOT OUT	LOADING	UN-LOADING	STOP	FF	REW	CUE	REV	PLAY	STILL	REC	REC PAUSE	REMARK
2 CTL WRITE	–	L	L	L	L	L	L	L	L	L	L	L		L	
9 12/14V $\underline{\text{ON}}$/$\overline{\text{OFF}}$	L	L	L	L	L	L	L	L	L	L	L	L	L	L	Hi - when standby, emergency stop mode.
14 $\overline{\text{12V}}$/$\underline{\text{14V}}$	–	H	H	L	H	H	H	H	H	L	L	L	L	L	
15 ENABLE NM1	L	H	H	H	H	H	H	H	H	H	H	H	L	L	
32 DIR F/R	L	H	H	L	H	H	L	H	L	H	L	H	L	H	
34 CAPSTAN F/R	L	L	H	L	H	L	L	H	L	H	L	L	L	L	

Logic/Servo Microcomputer Terminal Function (V-170F, V-180F)


IT01
ZC407503CP
LOGIC/SERVO MICROCOMPUTER
NC ① PA7
CONTROL WRITE ② PA6
CYLINDER FF ③ PA5
PSEUDO V CTL ④ PA4
CAPSTAN& CYLINDER SPEED ⑤ PA3
PICK UP SIGNAL ⑥ PA2
CAPSTAN FG PULSE ⑦ PA1
CONTROL PULSE ⑧ PA0
12/14V ON/OFF ⑨ PB7
RESET KDB ⑩ PB6
LOADING MOTOR
MOVEMENT CONTROL ⑪ PB5
⑫ PB4
SPEED CONTROL ⑬ PB3
12/14V SELECTION ⑭ PB2
ENABLE NMI ⑮ PB1
READ/WRITE ⑯ PB0
FM DETECT 2 (3H/4H) ⑰ PE0
FM DETECT 1 (2H) ⑱ PE1
REEL PULSE ⑲ PE2
SELECT (2H/3H/4H) ⑳ PE3
5V ㉑ Vrl
㉒ Vrh
5V ㉓ Vss
㉔ MOD B/Vstby
5V
VDD ㊽
PD5 ㊼ STROBE
PD4 ㊻ CLOCK
PD3 ㊺ VIDEO CTL DATA
PD2 ㊹ MECHADECK INPUT DATA
PD1 ㊸ DATA S
PD0 ㊷ DATA K
5V
IRQ ㊶
XIRQ ㊵ VERTICAL PULSE (NMI)
RESET ㊴ RESET
PC7 ㊳ COUNTER RATIO OR UP/DOWN CAPSTAN/CYLINDER OR
PC6 ㊲ COUNTER RATIO
PC5 ㊱ COUNTER DIV/PROG
PC4 ㉟ FIX VOLTAGE/INTEGRATOR
PC3 ㉞ CAPSTAN DIRECTION
PC2 ㉝ PRI
PC1 ㉜ TAPE DIRECTION
PC0 ㉛ CTL RETRIGGER (3H/4H)
XTAL ㉚
EXTAL ㉙ 8MHz
5V
R/W ㉘
E ㉗ KDB ENABLE
5V
AS ㉖
MOD A/LIR ㉕

IT50 (U2559B) Operation Data (V-170F, V-180F)

SPEED REGULATION

PIN 1	PIN 2	PIN 15	PIN 16	
H	H	L	H	Pin 5 voltage increase.
H	H	L	L	Pin 5 voltage decrease.
H	L	L	H	Pin 12 voltage increase.
H	L	L	L	Pin 12 voltage decrease.

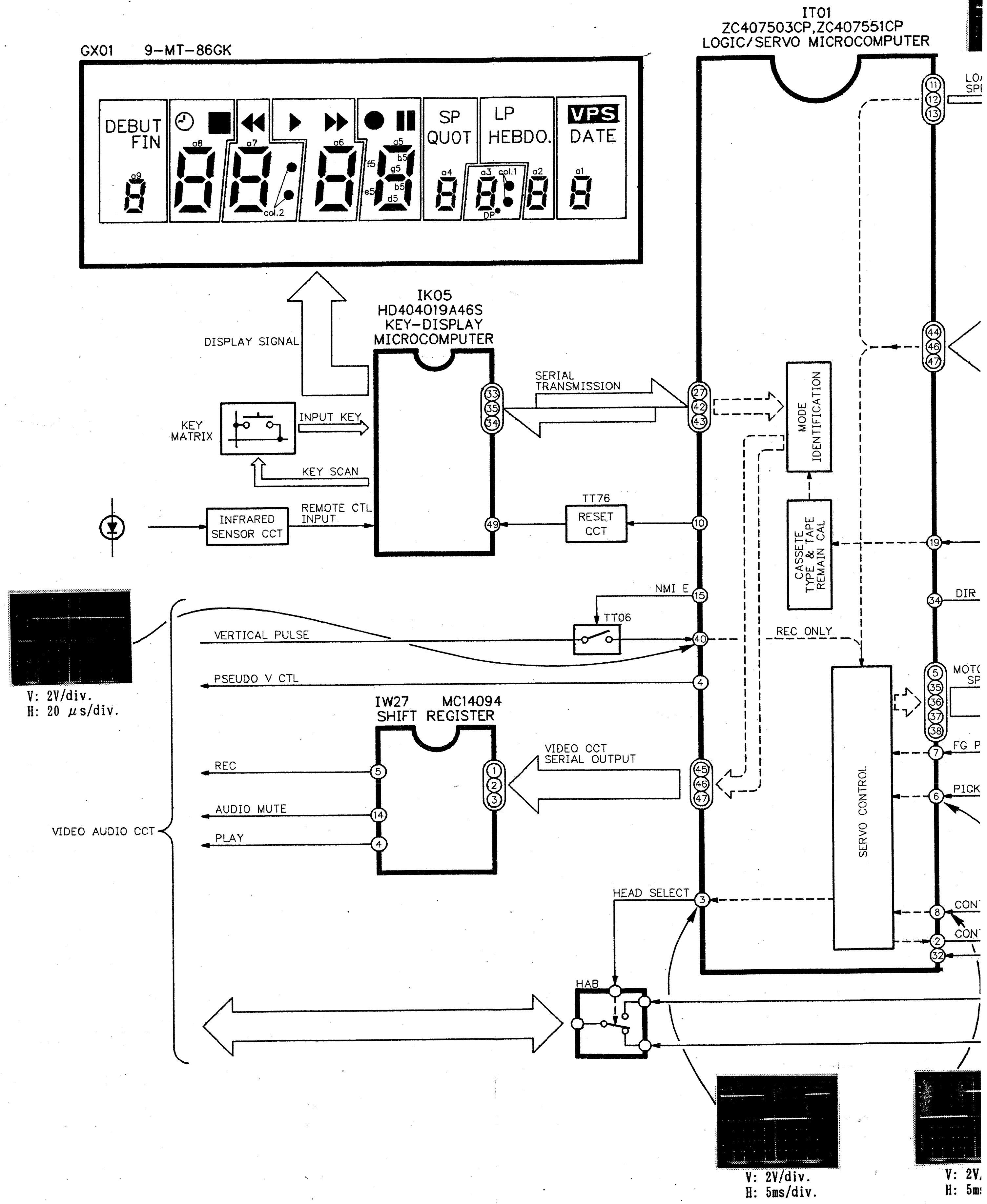
COUNTER SETTING RATIO FOR DIFFERENT MODE SPEED

PIN 1	PIN 2	PIN 15	PIN 16		COUNTER RATIO
L	L	H	L	LONG PLAY	1 : 1
L	H	H	L	STANDARD PLAY	1 : 2
L	L	H	H	SEARCH	1 : 4
L	H	H	H	FF/REW	1 : 8

NOTE:

TO SET COUNTER RATIO : PIN 1 MUST BE "L".
PIN 15 MUST BE "H".

AFTER COUNTER RATIO IS SET : PIN 15 GOES "L", COUNTER RATIO REMAINS PIN 1 GOES "H" TO REG. SPEED.


IT01
ZC407503CP, ZC407551CP
LOGIC/SERVO MICROCOMPUTER
GX01 9-MT-86GK
DEBUT FIN
SP QUOT
LP HEBDO.
VPS DATE
a9 a8 a7 a6 a5 b5 f5 g5 e5 d5 col.2 a4 a3 col.1 a2 a1 DP
DISPLAY SIGNAL
IK05
HD404019A46S
KEY-DISPLAY MICROCOMPUTER
KEY MATRIX
INPUT KEY
KEY SCAN
SERIAL TRANSMISSION
INFRARED SENSOR CCT
REMOTE CTL INPUT
TT76
RESET CCT
MODE IDENTIFICATION
CASSETE TYPE & TAPE REMAIN CAL
NMI E
TT06
VERTICAL PULSE
PSEUDO V CTL
REC ONLY
IW27 MC14094
SHIFT REGISTER
VIDEO CCT SERIAL OUTPUT
REC
AUDIO MUTE
PLAY
VIDEO AUDIO CCT
SERVO CONTROL
HEAD SELECT
HAB
V: 2V/div.
H: 20 μs/div.
V: 2V/div.
H: 5ms/div.
V: 2V,
H: 5m
LO
SP
DIR
MOT
SP
FG P
PICK
CON
CON

F)

TER RATIO

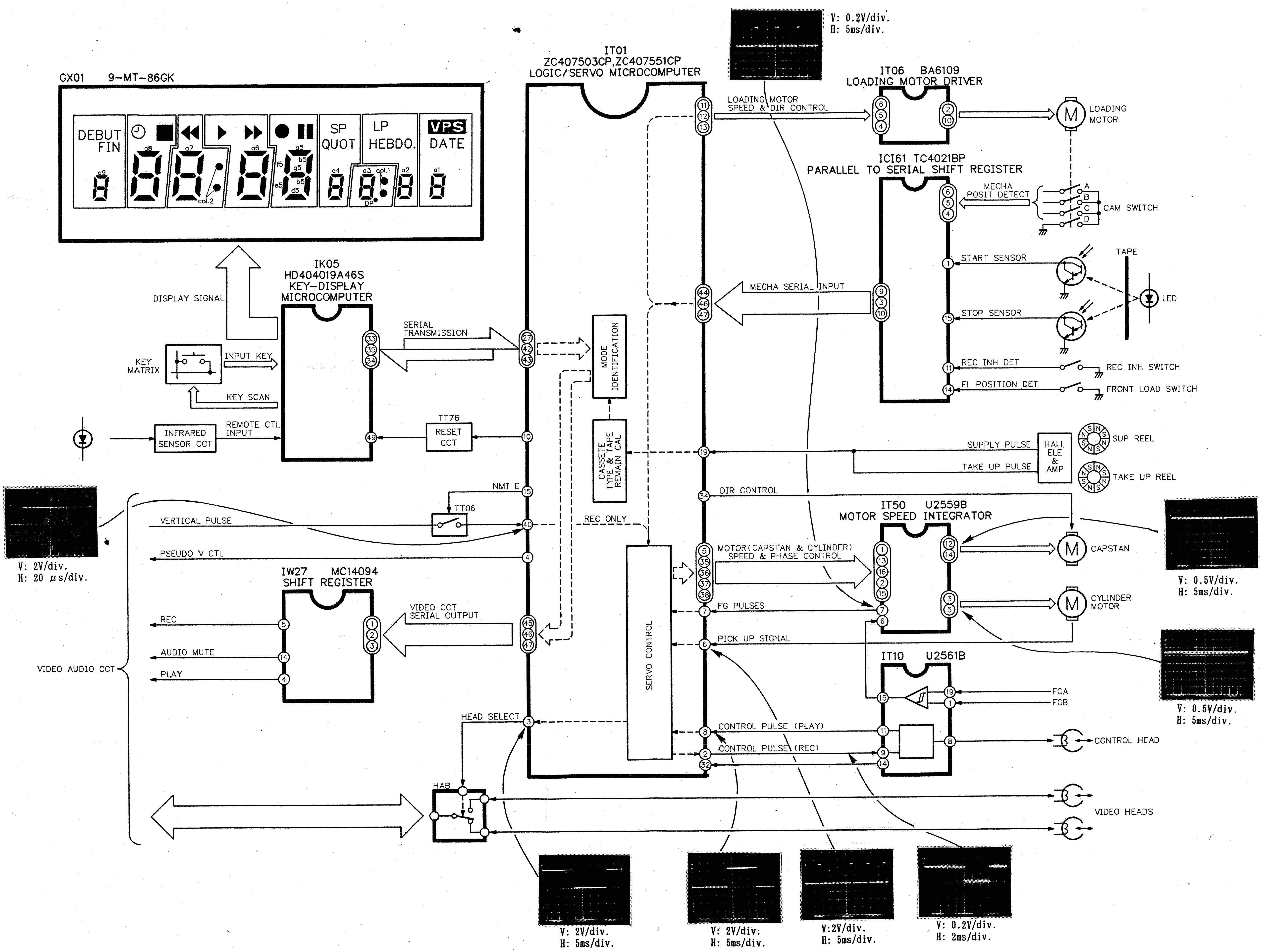
1 : 1

1 : 2

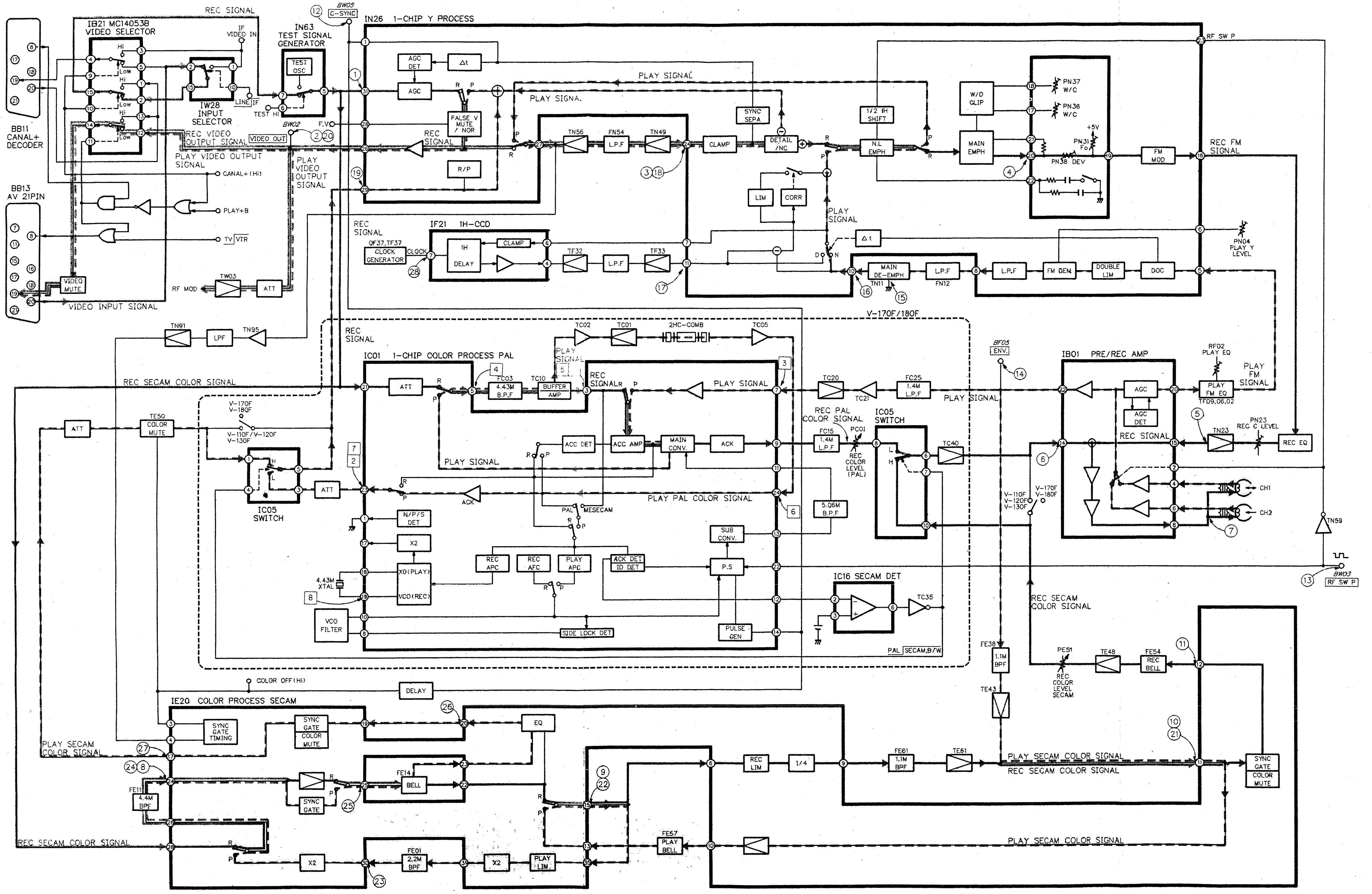
1 : 4

1 : 8

I" TO REG. SPEED.


GX01 9-MT-86GK
DEBUT FIN
SP QUOT
LP HEBDO.
VPS DATE
a9 a8 a7 a6 a5 f5 b5 g5 e5 b5 d5 col.2 a4 a3 col.1 a2 a1 DP
DISPLAY SIGNAL
IK05
HD404019A46S
KEY-DISPLAY
MICROCOMPUTER
KEY MATRIX
INPUT KEY
KEY SCAN
INFRARED SENSOR CCT
REMOTE CTL INPUT
SERIAL TRANSMISSION
TT76 RESET CCT
NMI E
TT06
VERTICAL PULSE
PSEUDO V CTL
IW27 MC14094
SHIFT REGISTER
VIDEO CCT SERIAL OUTPUT
REC
AUDIO MUTE
PLAY
VIDEO AUDIO CCT
HEAD SELECT
HAB
V: 2V/div.
H: 20 μs/div.
IT01
ZC407503CP,ZC407551CP
LOGIC/SERVO MICROCOMPUTER
MODE IDENTIFICATION
CASSETE TYPE & TAPE REMAIN CAL
REC ONLY
SERVO CONTROL
V: 0.2V/div.
H: 5ms/div.
IT06 BA6109
LOADING MOTOR DRIVER
LOADING MOTOR SPEED & DIR CONTROL
LOADING MOTOR
ICI61 TC4021BP
PARALLEL TO SERIAL SHIFT REGISTER
MECHA POSIT DETECT
A B C D
CAM SWITCH
MECHA SERIAL INPUT
START SENSOR
STOP SENSOR
TAPE
LED
REC INH DET
REC INH SWITCH
FL POSITION DET
FRONT LOAD SWITCH
SUPPLY PULSE
TAKE UP PULSE
HALL ELE & AMP
SUP REEL
TAKE UP REEL
DIR CONTROL
IT50 U2559B
MOTOR SPEED INTEGRATOR
MOTOR(CAPSTAN & CYLINDER) SPEED & PHASE CONTROL
CAPSTAN
CYLINDER MOTOR
FG PULSES
PICK UP SIGNAL
IT10 U2561B
FGA
FGB
CONTROL PULSE (PLAY)
CONTROL PULSE (REC)
CONTROL HEAD
VIDEO HEADS
V: 0.5V/div.
H: 5ms/div.
V: 0.5V/div.
H: 5ms/div.
V: 2V/div.
H: 5ms/div.
V: 2V/div.
H: 5ms/div.
V:2V/div.
H: 5ms/div.
V: 0.2V/div.
H: 2ms/div.

7-5. Video Block Diagram


REC SIGNAL
IB21 MC14053B
VIDEO SELECTOR
Hi
Low
IF
VIDEO IN
IW28
INPUT
SELECTOR
LINE IF
TEST Hi
IN63
TEST SIGNAL
GENERATOR
TEST
OSC
BW05
C-SYNC
BW02
VIDEO OUT
F.V
BB11
CANAL+
DECODER
BB13
AV 21PIN
REC VIDEO
OUTPUT SIGNAL
PLAY VIDEO OUTPUT
SIGNAL
PLAY
VIDEO
OUTPUT
SIGNAL
CANAL+ (Hi)
PLAY+B
TV VTR
VIDEO
MUTE
VIDEO INPUT SIGNAL
RF MOD
TW03
ATT
TN91
LPF
TN95
IN26 1-CHIP Y PROCESS
AGC
DET
Δt
AGC
R P
PLAY SIGNAL
FALSE V
MUTE
/ NOR
REC
SIGNAL
R/P
TN56
FN54
L.P.F
TN49
CLAMP
SYNC
SEPA
DETAIL
/NC
1/2 fH
SHIFT
N.L
EMPH
W/D
CLIP
MAIN
EMPH
PN37
W/C
PN36
W/C
+5V
PN31
Fo
PN38 DEV
FM
MOD
RF SW P
REC FM
SIGNAL
LIM
CORR
PLAY
SIGNAL
D N
MAIN
DE-EMPH
TN11
FN12
FM DEM
DOUBLE
LIM
DOC
PN04
PLAY Y
LEVEL
REC
SIGNAL
IF21 1H-CCD
QF37,TF37
CLOCK
GENERATOR
CLOCK
1H
DELAY
TF32
TF33
V-170F/180F
TC02
TC01
2HC-COMB
TC05
ICO1 1-CHIP COLOR PROCESS PAL
FC03
4.43M
B.P.F
TC10
BUFFER
AMP
REC
SIGNAL
TC20
TC21
FC25
1.4M
L.P.F
REC SECAM COLOR SIGNAL
V-170F
V-180F
V-110F/V-120F
V-130F
TE50
COLOR
MUTE
IC05
SWITCH
H
L
ACC DET
ACC AMP
MAIN
CONV.
ACK
PLAY PAL COLOR SIGNAL
PAL MESECAM
N/P/S
DET
X2
4.43M
XTAL
XO(PLAY)
VCO(REC)
VCO
FILTER
REC
APC
REC
AFC
PLAY
APC
ACK DET
ID DET
SUB
CONV.
P.S
PULSE
GEN
SIDE LOCK DET
5.06M
B.P.F
REC PAL
COLOR SIGNAL
FC15
1.4M
L.P.F
PC01
REC
COLOR
LEVEL
(PAL)
TC40
IC16 SECAM DET
TC35
PAL SECAM,B/W
BF05
ENV.
IB01 PRE/REC AMP
RF02
PLAY EQ
PLAY
FM EQ
TF09,06,02
PLAY
FM
SIGNAL
AGC
DET
REC SIGNAL
TN23
PN23
REC C LEVEL
REC EQ
CH1
CH2
V-110F
V-120F
V-130F
TN59
BW03
RF SW P
REC SECAM
COLOR SIGNAL
FE38
1.1M
BPF
TE43
PE51
REC
COLOR
LEVEL
SECAM
TE48
FE54
REC
BELL
COLOR OFF(Hi)
DELAY
IE20 COLOR PROCESS SECAM
SYNC
GATE
TIMING
SYNC
GATE
COLOR
MUTE
EQ
PLAY SECAM
COLOR SIGNAL
FE11
4.4M
BPF
FE14
BELL
SYNC
GATE
REC SECAM COLOR SIGNAL
FE01
2.2M
BPF
PLAY
LIM
FE57
PLAY
BELL
REC
LIM
1/4
FE61
1.1M
BPF
TE61
PLAY SECAM COLOR SIGNAL
REC SECAM COLOR SIGNAL
PLAY SECAM COLOR SIGNAL

(REC n

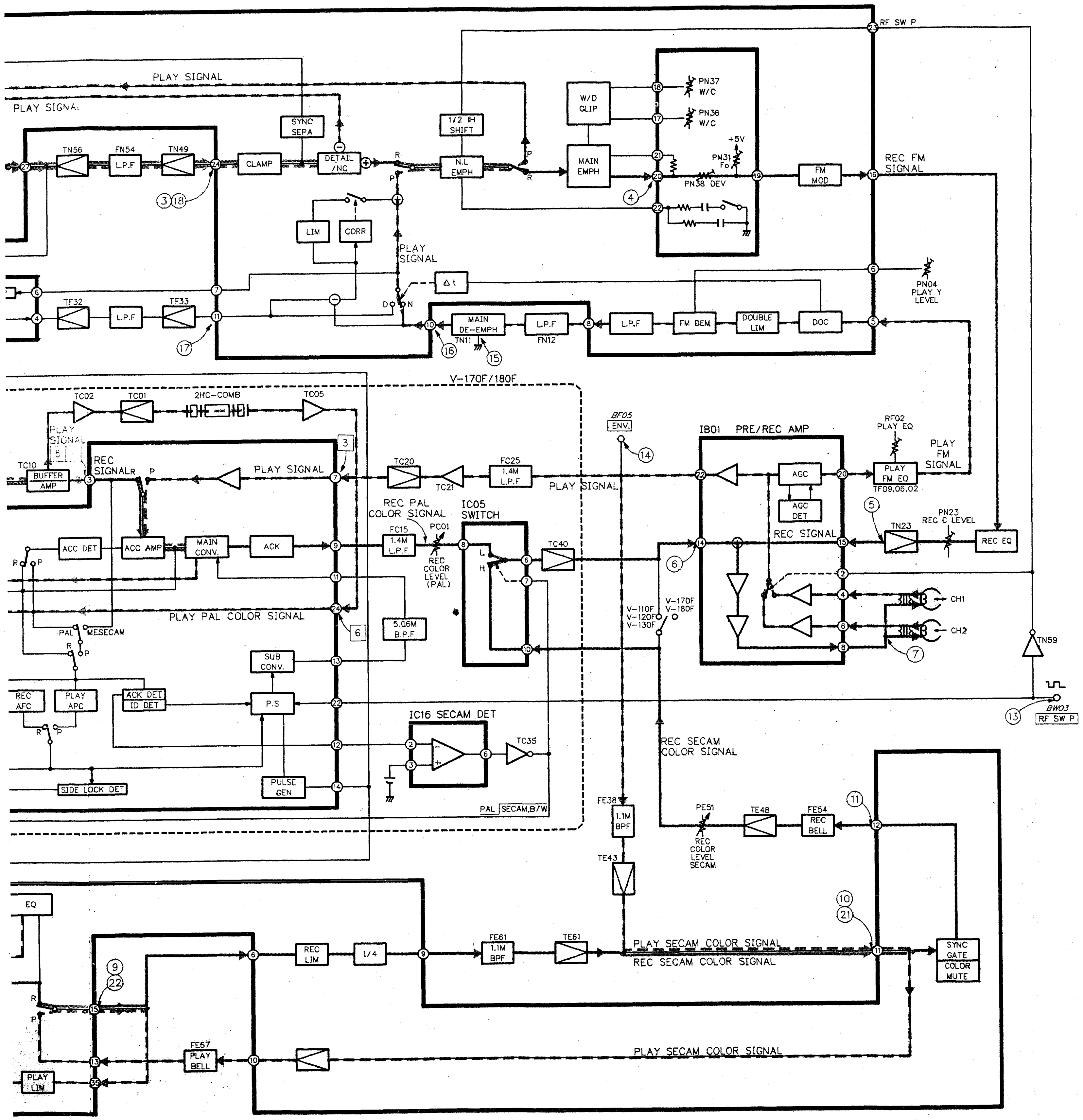
① I

② B

③ I

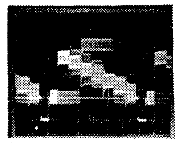
④ IN

⑤ TN


PLAY SIGNAL
PLAY SIGNA.
RF SW P
SYNC SEPA
1/2 IH SHIFT
W/D CLIP
PN37 W/C
PN36 W/C
+5V
PN31 Fo
MAIN EMPH
PN38 DEV
TN56
FN54
L.P.F
TN49
CLAMP
DETAIL /NC
N.L EMPH
FM MOD
REC FM SIGNAL
LIM
CORR
PLAY SIGNAL
Δt
PN04 PLAY Y LEVEL
TF32
L.P.F
TF33
MAIN DE-EMPH
TN11
L.P.F
FN12
L.P.F
FM DEM
DOUBLE LIM
DOC
V-170F/180F
TC02
TC01
2HC-COMB
TC05
PLAY SIGNAL
TC10
BUFFER AMP
REC SIGNAL
PLAY SIGNAL
TC20
TC21
FC25
1.4M L.P.F
PLAY SIGNAL
BF05 ENV.
IB01 PRE/REC AMP
AGC
AGC DET
RF02 PLAY EQ
PLAY FM EQ
TF09,06,02
PLAY FM SIGNAL
REC PAL COLOR SIGNAL
IC05 SWITCH
FC15
1.4M L.P.F
PC01
REC COLOR LEVEL (PAL)
TC40
REC SIGNAL
TN23
PN23 REC C LEVEL
REC EQ
ACC DET
ACC AMP
MAIN CONV.
ACK
CH1
CH2
PLAY PAL COLOR SIGNAL
PAL
MESECAM
5.06M B.P.F
V-110F
V-120F
V-130F
V-170F
V-180F
TN59
SUB CONV.
REC AFC
PLAY APC
ACK DET
ID DET
P.S
BW03
RF SW P
IC16 SECAM DET
TC35
SIDE LOCK DET
PULSE GEN
PAL
SECAM,B/W
FE38
1.1M BPF
TE43
REC SECAM COLOR SIGNAL
PE51
REC COLOR LEVEL SECAM
TE48
FE54
REC BELL
EQ
REC LIM
1/4
FE61
1.1M BPF
TE61
PLAY SECAM COLOR SIGNAL
REC SECAM COLOR SIGNAL
SYNC GATE
COLOR MUTE
FE57
PLAY BELL
PLAY SECAM COLOR SIGNAL
PLAY LIM

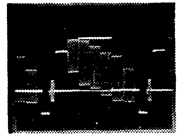
(REC mode)

① IN26, Pin ㉛
(SECAM)



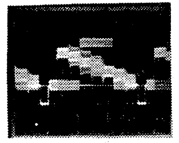
V: 0.2Vp-p/div.
H: 10 μs/div.

(PAL)



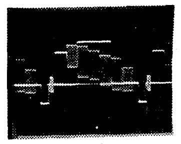
V: 0.2V/div.
H: 10 μ/div.

② BW02
(SECAM)



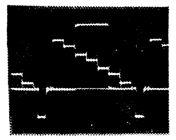
V: 0.5Vp-p/div.
H: 10 μs/div.

(PAL)



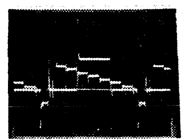
V: 0.5V/div.
H: 10 μs/div.

③ IN26, Pin ㉔



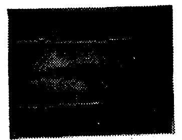
V: 0.1V/div.
H: 10 μs/div.

④ IN26,Pin ⑳



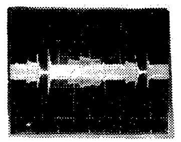
V: 0.2V/div.
H: 10 μs/div.

⑤ TN23, Emitter



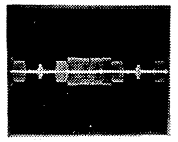
V: 0.1V/div.
H: 10 μ/div.

⑥ BF14, Pin ①
(SECAM)



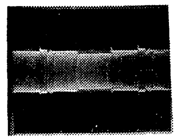
V: 0.05Vp-p/div.
H: 10 μs/div.

(PAL)



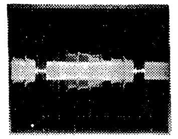
V: 0.05V/div.
H: 10 μs/div.

⑦ BB04, Pin ②~①



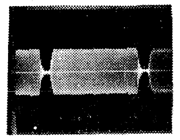
V: 0.05V/div.
H: 10 μs/div.

⑧ IE20, Pin ㉔
(SECAM)



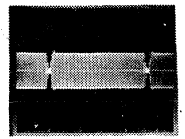
V: 0.05V/p-p
H: 10 μs/div.

⑨ IE20,Pin ⑮
(SECAM)



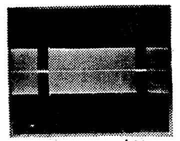
V: 0.05Vp-p/div.
H: 10 μs/div.

⑩ IE20,Pin ⑪
(SECAM)



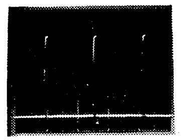
V: 0.05Vp-p/div.
H: 10 μs/div.

⑪ IE20,Pin ⑫
(SECAM)



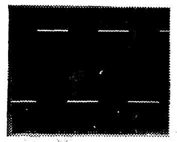
V: 0.2Vp-p/div.
H: 10 μs/div.

⑫ BW05



V: 1V/div.
H: 20 μs/div.

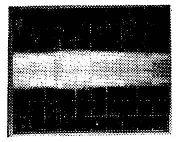
⑬ BW03



V: 1V/div.
H: 10ms/div.

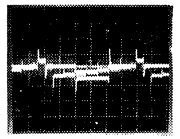
(PLAY mode)

⑭ BF05



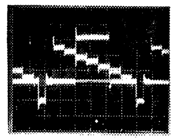
V: 0.1V/div.
H: 5ms/div.

⑮ TN11, Emitter



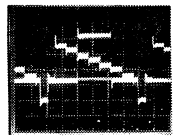
V: 0.2V/div.
H: 10 μ/div.

⑯ IN26, Pin ⑩



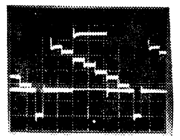
V: 0.1V/div.
H: 10 μs/div.

⑰ IN26, Pin ⑪



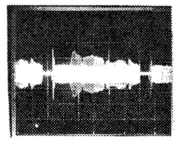
V: 0.1V/div.
H: 10 μs/div.

⑱ IN26, Pin ㉔



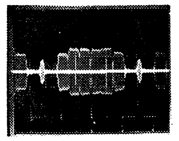
V: 0.1V/div.
H: 10 μs/div.

⑲ IN26, Pin ㉓
(SECAM)



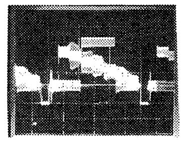
V: 0.1Vp-p/div.
H: 10 μs/div.

(PAL)



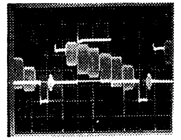
V: 0.1V/div.
H: 10 μs/div.

⑳ BW02
(SECAM)



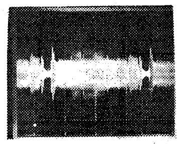
V: 0.5Vp-p/div.
H: 10 μs/div.

(PAL)



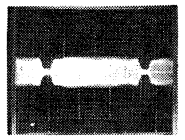
V: 0.5V/div.
H: 10 μs/div.

㉑ IE20, Pin ⑪
(SECAM)



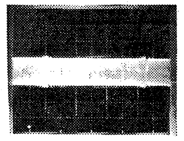
V: 0.02Vp-p/div.
H: 10 μs/div.

㉒ IE20, Pin ⑮
(SECAM)



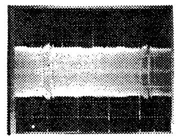
V: 0.05Vp-p/div.
H: 10 μs/div.

㉓ IE20, Pin ㉚
(SECAM)



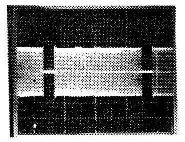
V: 0.05Vp-p/div.
H: 10 μs/div.

㉔ IE20, Pin ㉔
(SECAM)



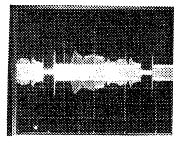
V: 0.02Vp-p/div.
H: 10 μs/div.

㉕ IE20, Pin ㉕
(SECAM)



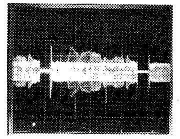
V: 0.1Vp-p/div.
H: 10 μs/div.

㉖ IE20, Pin ⑳
(SECAM)



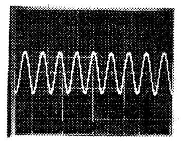
V: 0.05Vp-p/div.
H: 0.1μs/div.

㉗ IE20, Pin ⑰
(SECAM)



V: 0.2Vp-p/div.
H: 10 μs/div.

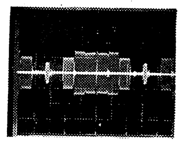
㉘ IF21, Pin ⑦



V: 0.5Vp-p/div.
H: 0.1μs/div.

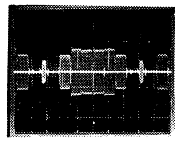
(CHV REC mode)

1 IC01, Pin ③
(PAL)



V: 0.05V/div.
H: 10 μs/div.

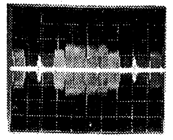
2 IC01, Pin ㉓
(PAL)



V: 0.2V/div.
H: 10 μs/div.

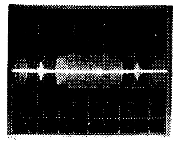
(CHV PLAY mode)

3 IC01, Pin ⑦
(PAL)



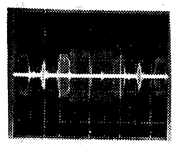
V: 0.1V/div.
H: 10 μs/div.

4 IC01, Pin ⑤
(PAL)



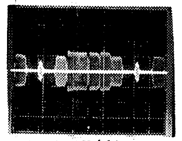
V: 0.5V/div.
H: 10 μ/div.

5 IC01, Pin ③
(PAL)



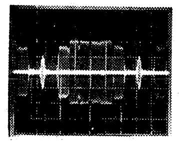
V: 0.1V/div.
H: 10 μ/div.

6 IC01, Pin ㉔
(PAL)



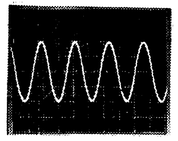
V: 0.1V/div.
H: 10 μs/div.

7 IC01, Pin ㉓
(PAL)



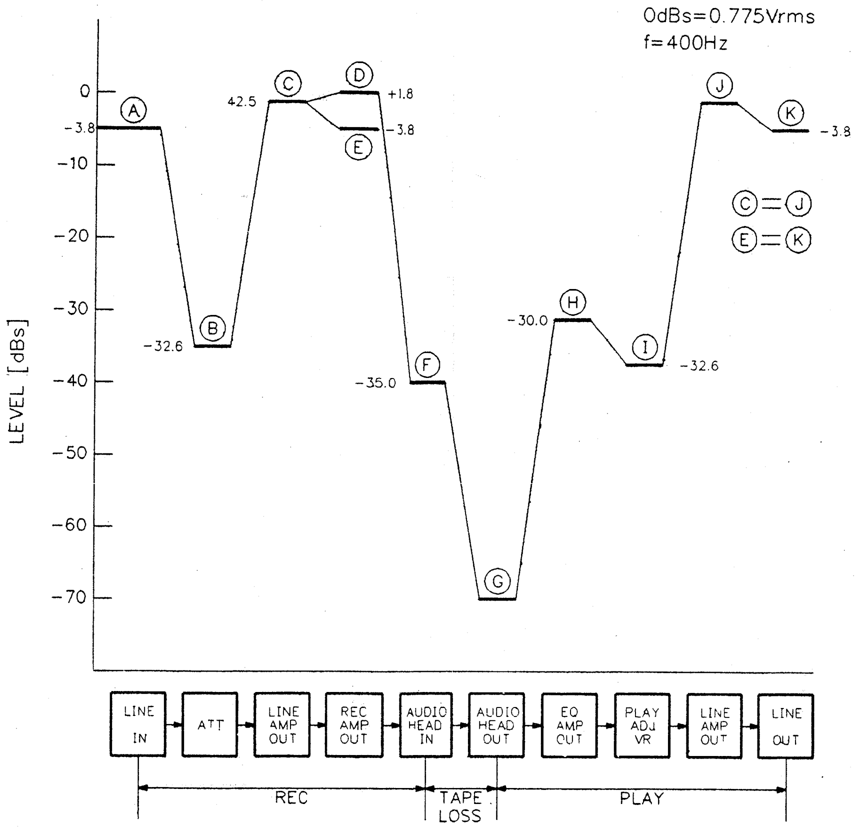
V: 0.2V/div.
H: 10 μs/div.

8 IC01, Pin ⑲

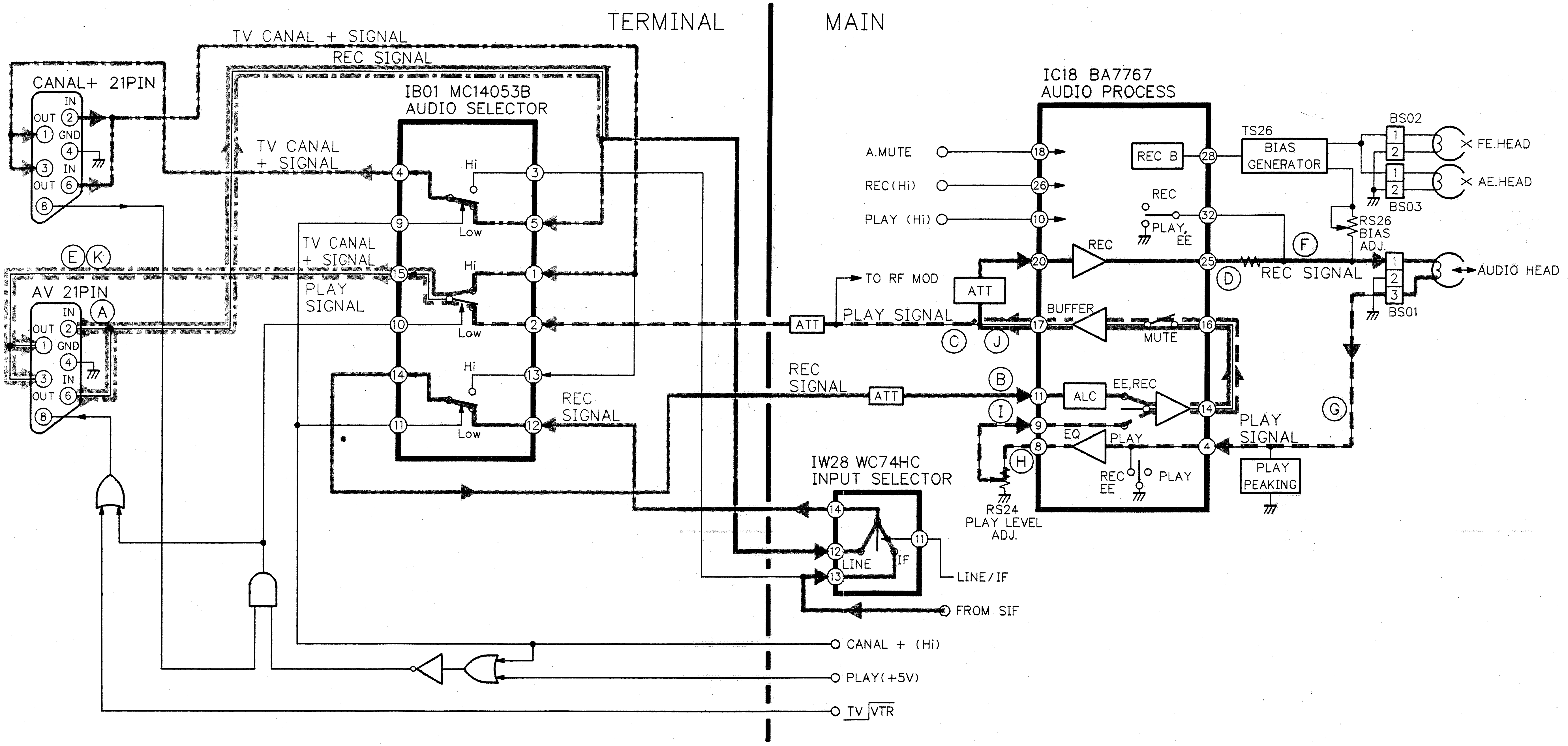


V: 0.2V/div.
H: 0.1μs/div.

Audio Level Chart

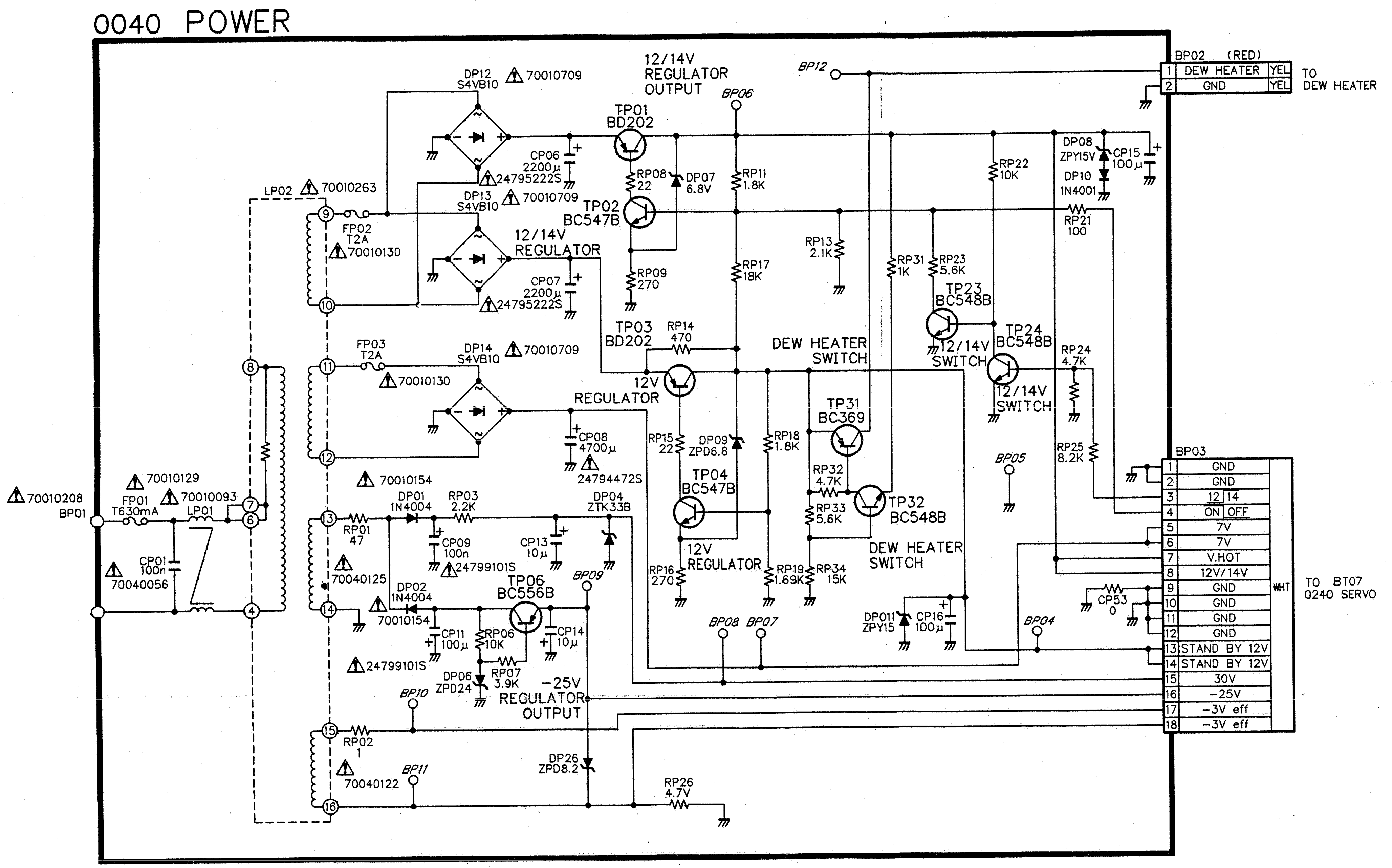


7-6. Audio Block Diagram


TERMINAL
MAIN
TV CANAL + SIGNAL
REC SIGNAL
CANAL+ 21PIN
IN
OUT
GND
IB01 MC14053B
AUDIO SELECTOR
TV CANAL
+ SIGNAL
Hi
Low
TV CANAL
+ SIGNAL
PLAY
SIGNAL
E
K
AV 21PIN
A
REC
SIGNAL
IC18 BA7767
AUDIO PROCESS
A.MUTE
REC(Hi)
PLAY (Hi)
REC B
REC
PLAY,
EE
TS26
BIAS
GENERATOR
BS02
FE.HEAD
AE.HEAD
BS03
RS26
BIAS
ADJ.
F
REC SIGNAL
D
AUDIO HEAD
BS01
TO RF MOD
ATT
PLAY SIGNAL
C
J
BUFFER
MUTE
REC
SIGNAL
B
ALC
EE,REC
I
EQ
PLAY
H
REC
EE
PLAY
PLAY
SIGNAL
G
PLAY
PEAKING
RS24
PLAY LEVEL
ADJ.
IW28 WC74HC
INPUT SELECTOR
LINE
IF
LINE/IF
FROM SIF
CANAL + (Hi)
PLAY(+5V)
TV/VTR

8. Circuit Diagrams

8-1. Power Supply Circuit Diagram


0040 POWER
BP01
70010208
FP01 T630mA
70010129
70010093
LP01
CP01 100n
70040056
LP02
70010263
FP02 T2A
70010130
DP12 S4VB10
70010709
DP13 S4VB10
CP06 2200µ
24795222S
12/14V REGULATOR
CP07 2200µ
FP03 T2A
DP14 S4VB10
CP08 4700µ
24794472S
12/14V REGULATOR OUTPUT
TP01 BD202
RP08 22
DP07 6.8V
RP11 1.8K
TP02 BC547B
RP09 270
RP17 18K
BP06
BP12
TP03 BD202
RP14 470
12V REGULATOR
RP15 22
DP09 ZPD6.8
RP18 1.8K
TP04 BC547B
12V REGULATOR
RP16 270
RP19 1.69K
RP34 15K
DEW HEATER SWITCH
TP31 BC369
RP32 4.7K
RP33 5.6K
TP32 BC548B
DEW HEATER SWITCH
RP13 2.1K
RP31 1K
RP23 5.6K
TP23 BC548B
12/14V SWITCH
TP24 BC548B
12/14V SWITCH
RP22 10K
DP08 ZPY15V
CP15 100µ
DP10 1N4001
RP21 100
RP24 4.7K
RP25 8.2K
BP05
CP53 0
BP04
DP011 ZPY15
CP16 100µ
BP08
BP07
RP01 47
70040125
DP01 1N4004
RP03 2.2K
CP09 100n
24799101S
CP13 10µ
DP04 ZTK33B
BP09
70010154
DP02 1N4004
TP06 BC556B
CP11 100µ
RP06 10K
CP14 10µ
24799101S
DP06 ZPD24
RP07 3.9K
-25V REGULATOR OUTPUT
BP10
RP02 1
70040122
BP11
DP26 ZPD8.2
RP26 4.7V
BP02 (RED)
1 DEW HEATER YEL
2 GND YEL
TO DEW HEATER
BP03
1 GND
2 GND
3 12 14
4 ON OFF
5 7V
6 7V
7 V.HOT
8 12V/14V
9 GND
10 GND
11 GND
12 GND
13 STAND BY 12V
14 STAND BY 12V
15 30V
16 -25V
17 -3V eff
18 -3V eff
WHT
TO BT07 0240 SERVO

(V)

	OFF			EE			PLAY			REC			CUE/REV			FF/REW		
	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E
TP01	22.1	1.8	22.6	20.9	14.5	21.5	20.2	12.3	20.8	19.8	12.3	20.5	20.1	14.4	20.7	19.9	14.5	20.6
TP02	0	22.0	0	8.0	20.8	7.4	5.9	20.2	5.3	5.9	19.8	5.3	8.0	20.0	7.4	8.0	19.8	7.4
TP03	20.9	12.0	21.6	20.6	12.1	21.2	20.3	12.1	20.9	19.6	12.1	20.3	20.1	12.1	20.8	19.9	12.1	20.5
TP04	5.8	20.8	5.2	5.9	20.6	5.3	5.9	20.2	5.3	5.9	19.6	5.2	5.9	20.1	5.3	5.9	19.9	5.3
TP06	-24.4	-41.6	-23.8	-24.4	-41.4	-23.8	-24.4	-41.0	-23.8	-24.4	-40.7	-23.8	-24.4	-40.8	-23.8	-24.4	-40.8	-23.8
TP23	0	0	0	0	8.0	0	0.5	0	0	0.5	0	0	0	8.0	0	0	8.0	0
TP24	0.5	0	0	0.5	0	0	0	0.5	0	0	0.5	0	0.5	0	0	0.5	0	0
TP31	11.3	12.1	12.1	12.1	0	12.1	12.1	0	12.1	12.1	0	12.1	12.1	0	12.1	12.1	0	12.1
TP32	8.7	11.4	8.1	8.8	12.1	14.5	8.8	12.1	12.3	8.8	12.1	12.3	8.8	12.1	14.4	8.8	12.1	14.4

8-2. Key Display Circuit Diagram

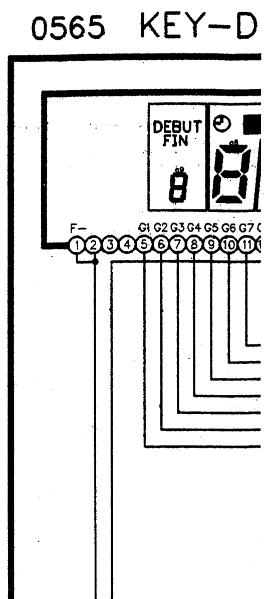
Note: (V-110F/120F/130F)

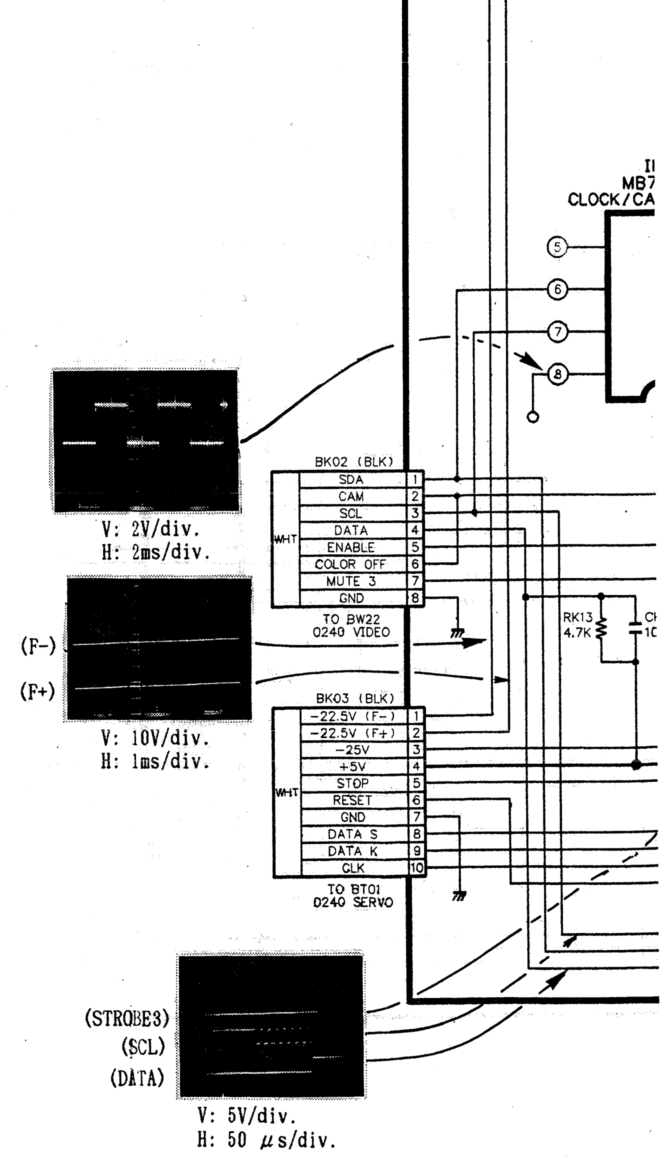
When replacing IK05 or XK03, perform the adjustment according to the methods stated in the Servo Circuit (Head Switching Point Setting).

Note: (V-170F/180F)

When replacing IK05 or XK03, perform the following methods.
In case of replacing IK05, replace it with HD404019A63S. (Refer to parts list for SN.)

1. After replacing the part, make a short circuit between the pin 25 of IK05 and GND.
2. Plug the power cord into the outlet pressing both Timer key and (−) key.
3. Press the Tuner key of remote control to make ON mode. And make sure the indicator SP or LP lights.
4. When LP lights, the pin 3 of BK04 touches with the pin 5, then the indication switches to SP. By this contact, SP and LP are switched periodically.
5. Plug the power cord off and open the short-circuit between pin 3 and 5 of BK04 performed on item 1 above.
6. Perform same procedure as item 2 above.
7. Perform the Head Switching Point Setting in the Servo circuit.


0565 KEY-D
DEBUT FIN
F−


MB7
CLOCK/CA
V: 2V/div.
H: 2ms/div.
(F−)
(F+)
V: 10V/div.
H: 1ms/div.
BK02 (BLK)
SDA
CAM
SCL
DATA
ENABLE
COLOR OFF
MUTE 3
GND
WHT
TO BW22 0240 VIDEO
BK03 (BLK)
−22.5V (F−)
−22.5V (F+)
−25V
+5V
STOP
RESET
GND
DATA S
DATA K
CLK
TO BT01 0240 SERVO
RK13 4.7K
(STROBE3)
(SCL)
(DATA)
V: 5V/div.
H: 50 µs/div.

8-2. Key Display Circuit Diagram

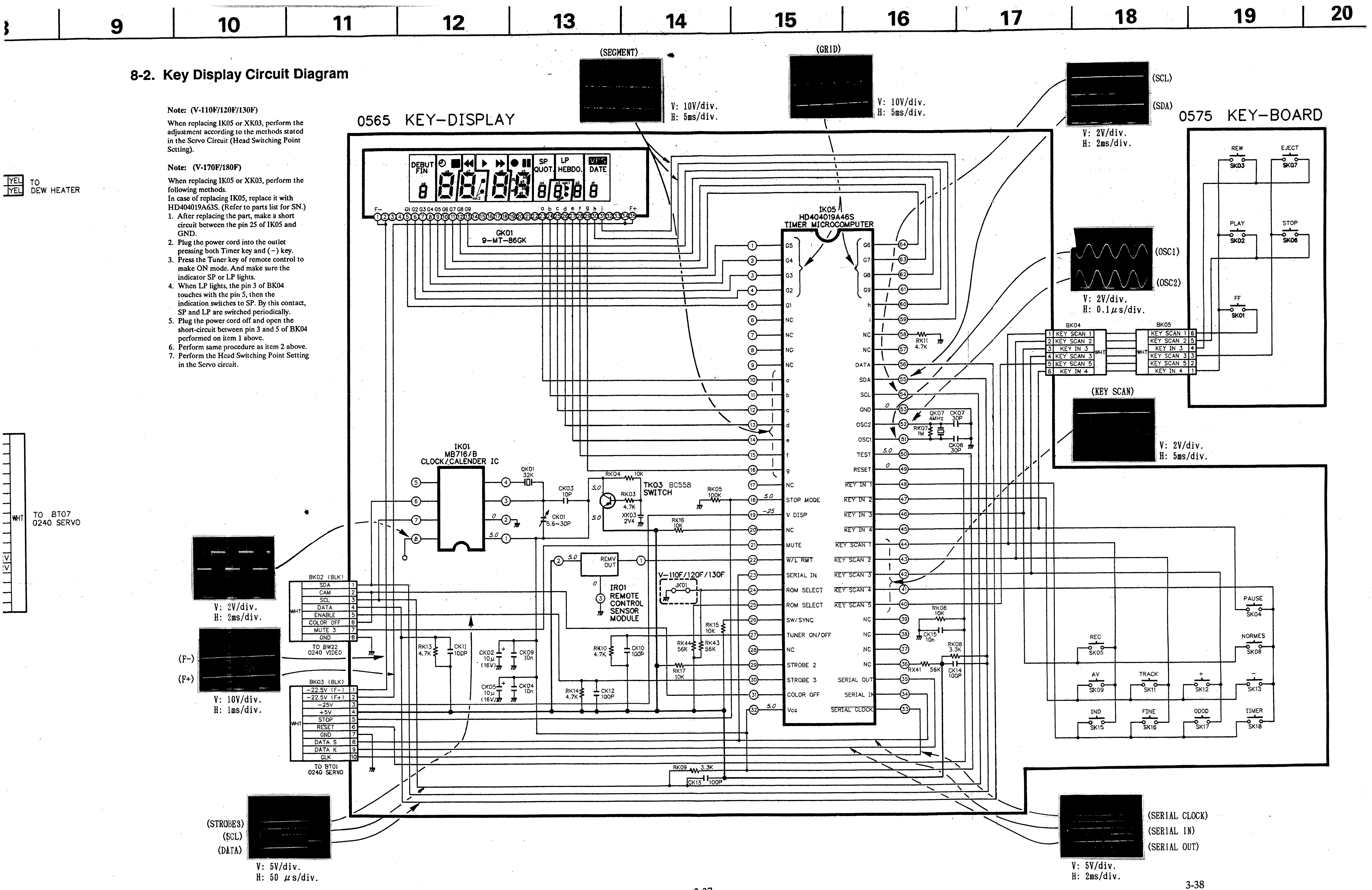
Note: (V-110F/120F/130F)

When replacing IK05 or XK03, perform the adjustment according to the methods stated in the Servo Circuit (Head Switching Point Setting).

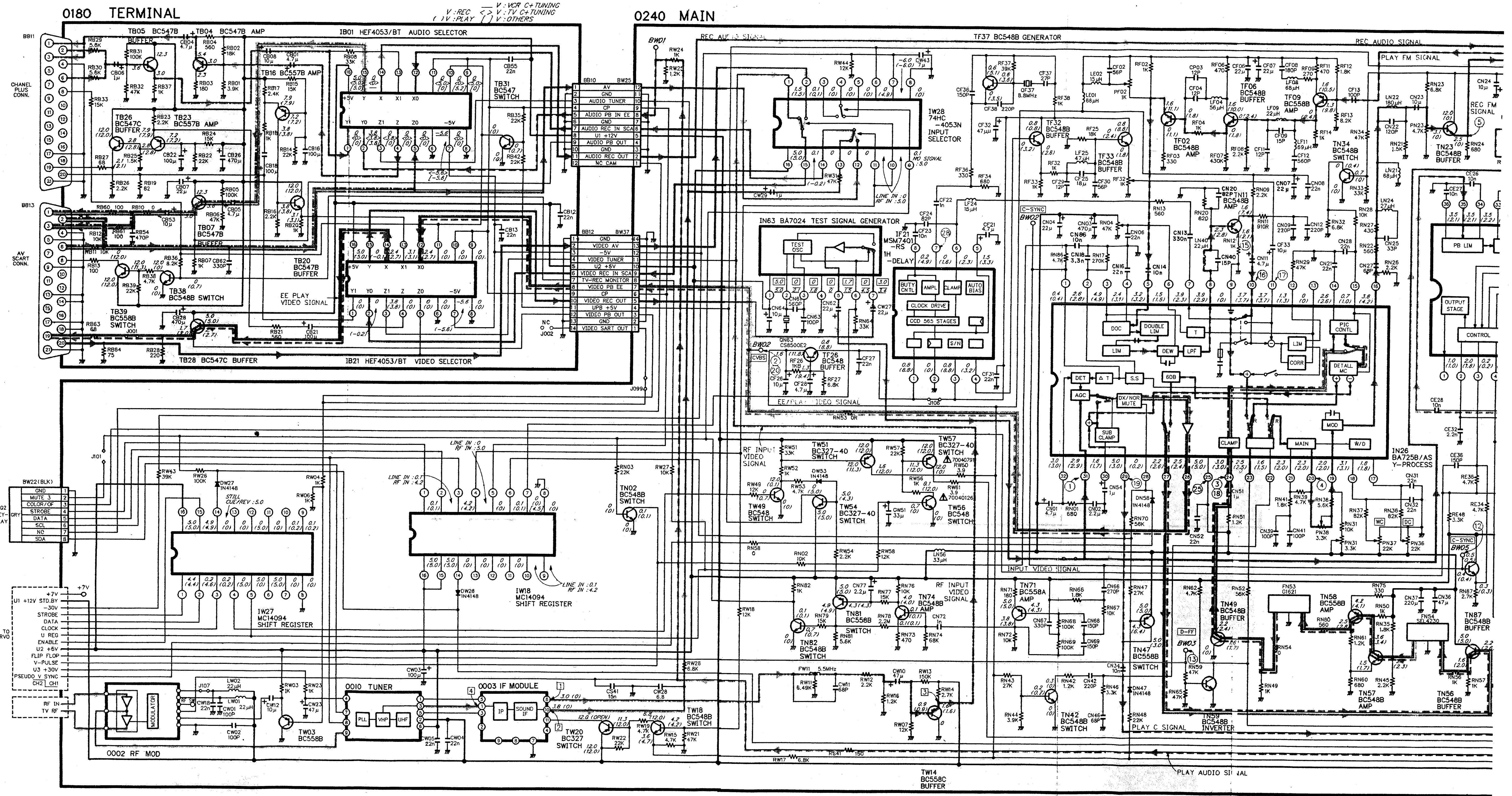
Note: (V-170F/180F)

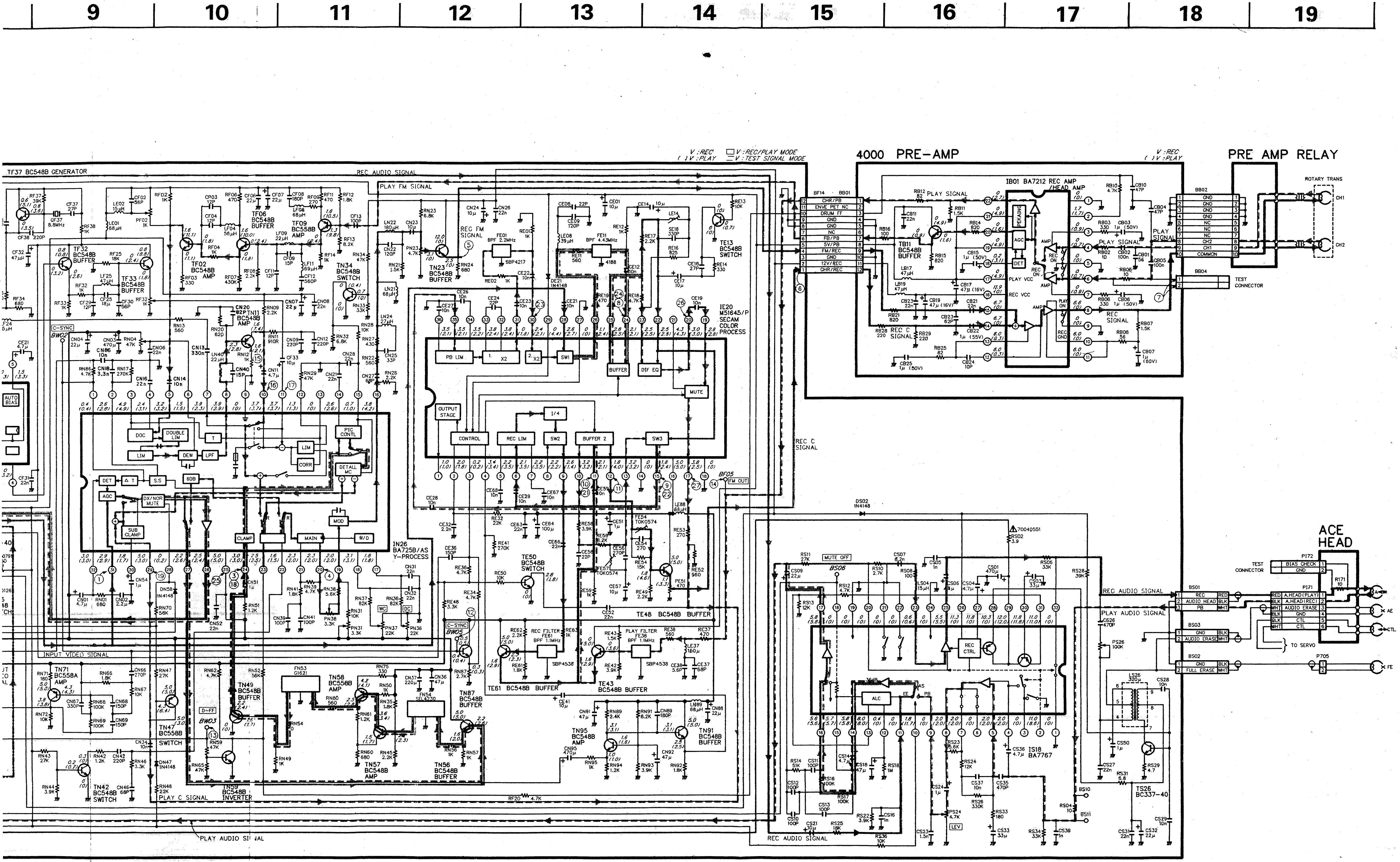
When replacing IK05 or XK03, perform the following methods.
In case of replacing IK05, replace it with HD404019A63S. (Refer to parts list for SN.)

1. After replacing the part, make a short circuit between the pin 25 of IK05 and GND.
2. Plug the power cord into the outlet pressing both Timer key and (−) key.
3. Press the Tuner key of remote control to make ON mode. And make sure the indicator SP or LP lights.
4. When LP lights, the pin 3 of BK04 touches with the pin 5, then the indication switches to SP. By this contact, SP and LP are switched periodically.
5. Plug the power cord off and open the short-circuit between pin 3 and 5 of BK04 performed on item 1 above.
6. Perform same procedure as item 2 above.
7. Perform the Head Switching Point Setting in the Servo circuit.


8
9
10
11
12
13
14
15
16
17
18
19
20
YEL
YEL
TO DEW HEATER
WHT
TO BT07 0240 SERVO
0565 KEY-DISPLAY
0575 KEY-BOARD
(SEGMENT)
V: 10V/div.
H: 5ms/div.
(GRID)
V: 10V/div.
H: 5ms/div.
(SCL)
(SDA)
V: 2V/div.
H: 2ms/div.
(OSC1)
(OSC2)
V: 2V/div.
H: 0.1μs/div.
(KEY SCAN)
V: 2V/div.
H: 5ms/div.
(SERIAL CLOCK)
(SERIAL IN)
(SERIAL OUT)
V: 5V/div.
H: 2ms/div.
(STROBE3)
(SCL)
(DATA)
V: 5V/div.
H: 50 μs/div.
V: 2V/div.
H: 2ms/div.
(F−)
(F+)
V: 10V/div.
H: 1ms/div.
DEBUT FIN
SP QUOT.
LP HEBDO.
VPS
DATE
F−
G1 G2 G3 G4 G5 G6 G7 G8 G9
a b c d e f g h i
F+
GK01 9-MT-86GK
IK05 HD404019A46S TIMER MICROCOMPUTER
G5
G4
G3
G2
G1
NC
a
b
c
d
e
f
g
STOP MODE
V DISP
MUTE
W/L RMT
SERIAL IN
ROM SELECT
SW/SYNC
TUNER ON/OFF
STROBE 2
STROBE 3
COLOR OFF
Vcc
G6
G7
G8
G9
h
i
DATA
SDA
SCL
GND
OSC2
OSC1
TEST
RESET
KEY IN 1
KEY IN 2
KEY IN 3
KEY IN 4
KEY SCAN 1
KEY SCAN 2
KEY SCAN 3
KEY SCAN 4
KEY SCAN 5
SERIAL OUT
SERIAL IN
SERIAL CLOCK
5.0
−25
0
RK11 4.7K
QK07 4MHz
CK07 30P
RK07 1M
CK08 30P
RK06 10K
CK15 10n
RK08 3.3K
RX41 56K
CK14 100P
IK01 MB716/B CLOCK/CALENDER IC
QKD1 32K
CK03 10P
CK01 5.6~30P
RK04 10K
RK03 4.7K
XK03 2V4
TK03 BC558 SWITCH
RK05 100K
RK16 10K
REMV OUT
IR01 REMOTE CONTROL SENSOR MODULE
V-110F/120F/130F
JK01
RK15 10K
RK44 56K
RK43 56K
RK17 10K
RK10 4.7K
CK10 100P
RK13 4.7K
CK11 100P
CK02 10μ (16V)
CK09 10n
CK05 10μ (16V)
CK04 10n
RK14 4.7K
CK12 100P
RK09 3.3K
CK13 100P
BK02 (BLK)
SDA
CAM
SCL
DATA
ENABLE
COLOR OFF
MUTE 3
GND
TO BW22 0240 VIDEO
BK03 (BLK)
−22.5V (F−)
−22.5V (F+)
−25V
+5V
STOP
RESET
GND
DATA S
DATA K
CLK
TO BT01 0240 SERVO
BK04
KEY SCAN 1
KEY SCAN 2
KEY IN 3
KEY SCAN 3
KEY SCAN 5
KEY IN 4
BK05
REW
SK03
EJECT
SK07
PLAY
SK02
STOP
SK06
FF
SK01
PAUSE
SK04
NORMES
SK08
REC
SK05
AV
SK09
TRACK
SK11
+
SK12
−
SK13
IND
SK15
FINE
SK16
ODOD
SK17
TIMER
SK18

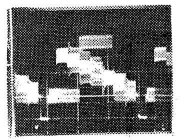
8-3-(1). Main (PIF, Video, Audio) Circuit Diagram (V-110F, V-120F, V-130F)


1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
0180 TERMINAL
0240 MAIN
V : REC
( ) V : PLAY
— V : VCR C+TUNING
< > V : TV C+ TUNING
[ ] V : OTHERS
TB05 BC547B BUFFER
TB04 BC547B AMP
IB01 HEF4053/BT AUDIO SELECTOR
TB16 BC557B AMP
TB26 BC547C BUFFER
TB23 BC557B AMP
TB31 BC547 SWITCH
TB07 BC547B BUFFER
TB20 BC547B BUFFER
TB38 BC548B SWITCH
TB39 BC558B SWITCH
TB28 BC547C BUFFER
IB21 HEF4053/BT VIDEO SELECTOR
EE PLAY VIDEO SIGNAL
CHANEL PLUS CONN.
AV SCART CONN.
BB11
BB13
BB10
BW25
BB12
BW37
AV
GND
AUDIO TUNER
CP
AUDIO PB IN EE
GND
AUDIO REC IN SCA
U1 +12V
AUDIO PB OUT
GND
AUDIO REC OUT
NC CAM
VIDEO AV
-5V
VIDEO TUNER
U2 +5V
VIDEO REC IN SCA
TV-REC MONITOR
VIDEO PB EE
CP
VIDEO REC OUT
UPB +5V
VIDEO PB OUT
GND
VIDEO SART OUT
BW01
REC AUDIO SIGNAL
TF37 BC548B GENERATOR
IW28 74HC-4053N INPUT SELECTOR
LINE IN : 0 RF IN : 5.0
IN63 BA7024 TEST SIGNAL GENERATOR
TEST OSC
IF21 MSM7401-RS 1H-DELAY
BUTY CNTL
AMPL
CLAMP
AUTO BIAS
CLOCK DRIVE
CCD 565 STAGES
BW02
CVBS
QN83 CS8500E2
TF26 BC548 BUFFER
EE/PLAY VIDEO SIGNAL
TF32 BC548B BUFFER
TF33 BC548B BUFFER
TF02 BC548B AMP
TF06 BC548B BUFFER
TF09 BC558B AMP
TN34 BC548B SWITCH
TN23 BC548B BUFFER
TN11 BC548B AMP
PLAY FM SIGNAL
REC FM SIGNAL
C-SYNC
BW02
PB LIM
OUTPUT STAGE
CONTROL
DOC
DOUBLE LIM
LIM
DEW
LPF
DET
AGC
DX/NOR MUTE
SUB CLAMP
S.S
60B
LIM
CORR
PIC CONTL
DETAIL MC
CLAMP
MAIN
MOD
W/D
IN26 BA7258/AS Y-PROCESS
BWO5
BW22(BLK)
GND
MUTE 3
COLOR/OF
STROBE
DATA
SCL
NC
SDA
TO BK02 0585 KEY-DISPLAY
J101
STILL CUE/REV : 5.0
IW27 MC14094 SHIFT REGISTER
LINE IN : 0.1 RF IN : 4.2
IW18 MC14094 SHIFT REGISTER
TN02 BC548B SWITCH
RF INPUT VIDEO SIGNAL
TW51 BC327-40 SWITCH
TW57 BC327-40 SWITCH
TW49 BC548 SWITCH
TW54 BC327-40 SWITCH
TW56 BC548 SWITCH
INPUT VIDEO SIGNAL
TN81 BC558B SWITCH
TN74 BC548B AMP
TN82 BC548B SWITCH
RF INPUT VIDEO SIGNAL
TN71 BC558A AMP
TN47 BC558B SWITCH
TN42 BC548B SWITCH
TN49 BC548B BUFFER
D-FF
BW03
N59 BC548B INVERTER
PLAY C SIGNAL
TN58 BC558B AMP
TN57 BC548B AMP
TN56 BC548B BUFFER
TN87 BC548B BUFFER
FN53 G1621
FN54 SEL4230
PLAY AUDIO SIGNAL
+7V
U1 +12V STD.BY
-30V
STROBE
DATA
CLOCK
U REG
ENABLE
U2 +6V
FLIP FLOP
V-PULSE
U3 +30V
PSEUDO V SYNC
CH2
CH1
TO SERVO
RF IN
TV RF
MODULATOR
0002 RF MOD
TW03 BC558B
0010 TUNER
PLL
VHF
UHF
0003 IF MODULE
IP
SOUND IF
TW20 BC327 SWITCH
TW18 BC548B SWITCH
FW11 5.5MHz
TW14 BC558C BUFFER


9
10
11
12
13
14
15
16
17
18
19
V :REC
( )V :PLAY
V :REC/PLAY MODE
V :TEST SIGNAL MODE
4000 PRE-AMP
PRE AMP RELAY
TF37 BC548B GENERATOR
REC AUDIO SIGNAL
PLAY FM SIGNAL
TF32 BC548B BUFFER
TF33 BC548B BUFFER
TF02 BC548B AMP
TF06 BC548B BUFFER
TF09 BC558B AMP
TN34 BC548B SWITCH
TN23 BC548B BUFFER
REC FM SIGNAL
TN11 BC548B AMP
TE13 BC548B SWITCH
IE20 M51645/P SECAM COLOR PROCESS
PB LIM
X2
SW1
BUFFER
DIF EQ
MUTE
OUTPUT STAGE
CONTROL
REC LIM
SW2
BUFFER 2
SW3
1/4
FM OUT
IB01 BA7212 REC AMP /HEAD AMP
TB11 BC548B BUFFER
PLAY SIGNAL
REC SIGNAL
REC C SIGNAL
PEAKING
AGC
DET
PLAY VCC
REC VCC
ROTARY TRANS
CH1
CH2
TEST CONNECTOR
C-SYNC
AUTO BIAS
DOC
DOUBLE LIM
LIM
DEW
LPF
PIC CONTL
CORR
DETAIL MC
DET
AGC
DX/NOR MUTE
SUB CLAMP
S.S
6DB
CLAMP
MAIN
MOD
W/D
IN26 BA7258/AS Y-PROCESS
TE50 BC548B SWITCH
TE48 BC548B BUFFER
REC FILTER FE61 BPF 1.1MHz
PLAY FILTER FE38 BPF 1.1MHz
TE61 BC548B BUFFER
TE43 BC548B BUFFER
TN95 BC548B AMP
TN91 BC548B BUFFER
TN71 BC558A AMP
TN47 BC558B SWITCH
TN42 BC548B SWITCH
TN49 BC548B BUFFER
TN59 BC548B INVERTER
TN58 BC558B AMP
TN57 BC548B AMP
TN56 BC548B BUFFER
TN87 BC548B BUFFER
INPUT VIDEO SIGNAL
PLAY C SIGNAL
PLAY AUDIO SIGNAL
REC C SIGNAL
MUTE OFF
BS06
ACE HEAD
BIAS CHECK
REC
AUDIO HEAD
PB
GND
AUDIO ERASE
FULL ERASE
A.HEAD(PLAY)
A.HEAD(REC)
CTL
TO SERVO
REC AUDIO SIGNAL
PLAY AUDIO SIGNAL
REC CTRL
ALC
IS18 BA7767
TS26 BC337-40
LEV
REC AUDIO SIGNAL
PLAY AUDIO SIGNAL

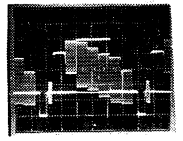
(REC mode)

① IN26, Pin ㉛ E-9
(SECAM)



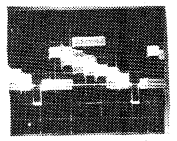
V: 0.2Vp-p/div.
H: 10 µs/div.

(PAL)



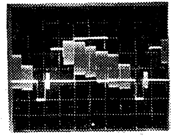
V: 0.2V/div.
H: 10 µ/div.

② BW02 D-7
(SECAM)



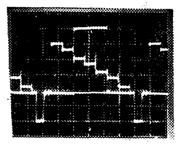
V: 0.5Vp-p/div.
H: 10 µs/div.

(PAL)



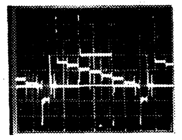
V: 0.5V/div.
H: 10 µs/div.

③ IN26, Pin ㉔ E-10



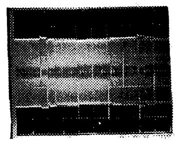
V: 0.1V/div.
H: 10 µs/div.

④ IN26.Pin ⑳ E-11



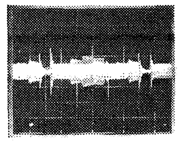
V: 0.2V/div.
H: 10 µs/div.

⑤ TN23, Emitter B-12



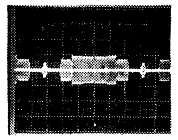
V: 0.1V/div.
H: 10 µ/div.

⑥ BF14, Pin ① C-15
(SECAM)



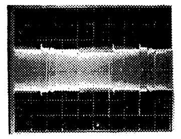
V: 0.05Vp-p/div.
H: 10 µs/div.

(PAL)



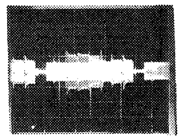
V: 0.05V/div.
H: 10 µs/div.

⑦ BB04, Pin ②~① C-18



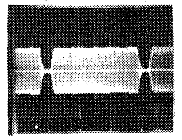
V: 0.05V/div.
H: 10 µs/div.

⑧ IE20, Pin ㉔ C-13
(SECAM)



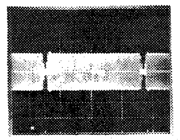
V: 0.05V/p-p
H: 10 µs/div.

⑨ IE20.Pin ⑮ D-14
(SECAM)



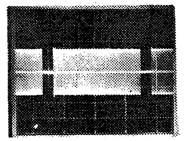
V: 0.05Vp-p/div.
H: 10 µs/div.

⑩ IE20.Pin ⑪ D-13
(SECAM)



V: 0.05Vp-p/div.
H: 10 µs/div.

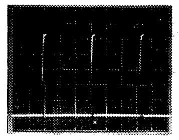
⑪ IE20.Pin ⑫ D-13
(SECAM)



V: 0.2Vp-p/div.
H: 10 µs/div.

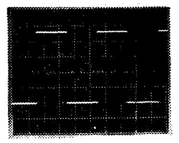
(PLAY mode)

⑫ BW05 E-12 (V-110F)
E-3 (V-170F)



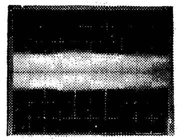
V: 1V/div.
H: 20 µs/div.

⑬ BW03 F-10



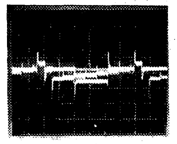
V: 1V/div.
H: 10ms/div.

⑭ BF05 D-14 (V-110F)
C-18 (V-170F)



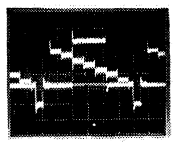
V: 0.1V/div.
H: 5ms/div.

⑮ TN11, Emitter C-10



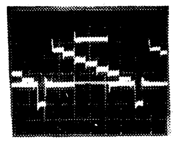
V: 0.2V/div.
H: 10 µ/div.

⑯ IN26, Pin ⑩ C-10



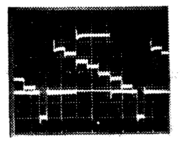
V: 0.1V/div.
H: 10 µs/div.

⑰ IN26, Pin ⑪ C-10



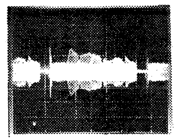
V: 0.1V/div.
H: 10 µs/div.

⑱ IN26, Pin ㉔
C-11 (V-110F) E-10 (V-170F)



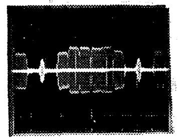
V: 0.1V/div.
H: 10 µs/div.

⑲ IN26, Pin ㉙ E-9
(SECAM)



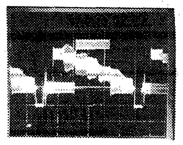
V: 0.1Vp-p/div.
H: 10 µs/div.

(PAL)



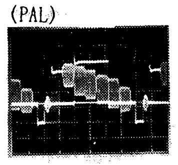
V: 0.1V/div.
H: 10 µ/div.

⑳ BW02 D-7
(SECAM)



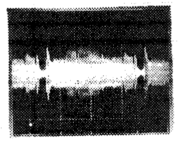
V: 0.5Vp-p/div.
H: 10 µs/div.

(PAL)



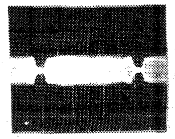
V: 0.5V/div.
H: 10 µs/div.

㉑ IE20,Pin ⑪ D-13
(SECAM)



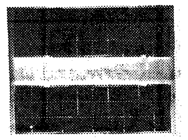
V: 0.02Vp-p/div.
H: 10 µs/div.

㉒ IE20, Pin ⑮ D-14
(SECAM)



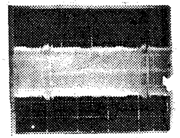
V: 0.05Vp-p/div.
H: 10 µ/div.

㉓ IE20, Pin ㉚ C-13
(SECAM)



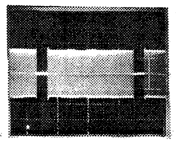
V: 0.05Vp-p/div.
H: 10 µ/div.

㉔ IE20, Pin ㉔ C-13
(SECAM)



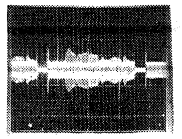
V: 0.02Vp-p/div.
H: 10 µs/div.

㉕ IE20, Pin ㉕ E-10
(SECAM)



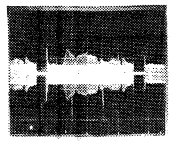
V: 0.1Vp-p/div.
H: 10 µs/div.

㉖ IE20, Pin ⑳ C-14
(SECAM)



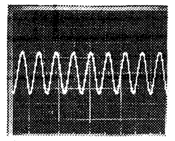
V: 0.5Vp-p/div.
H: 0.1µs/div.

㉗ IE20, Pin ⑰ D-14



V: 0.2Vp-p/div.
H: 10 µs/div.

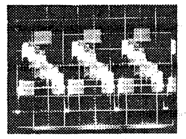
㉘ IF21, Pin ⑦ C-8



V: 0.5Vp-p/div.
H: 0.1µs/div.

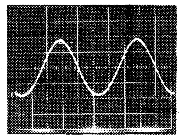
(PIF V-110F/120F/130F)

Ⓐ IF Module, Pin ⑥ F-5



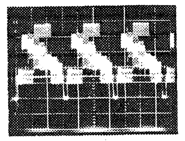
V: 10 µs/div.
H: 0.5V/div.

Ⓑ IF Module, Pin ⑦ G-5



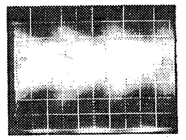
V: 0.2ms/div.
H: 0.5V/div.

Ⓒ TW14, Emitter F-8



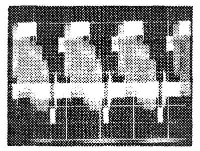
V: 0.2V/div.
H: 10 µs/div.

Ⓓ IF Module, Pin ① F-5



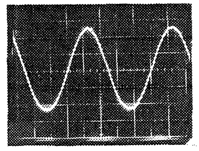
V: 10mV/div.
H: 20 µs/div.

🄱 IF module, Pin ⑥
(PAL) F-5



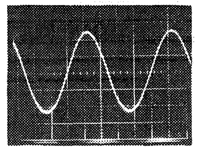
V: 0.5V/div.
H: 20 µsec/div.

🄲 IF module, Pin ⑦
(SECAM) G-5



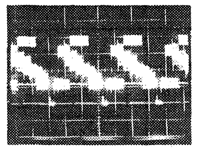
V: 0.5V/div.
H: 20 µsec/div.

🄳 IF module, Pin ⑦
(PAL) G-5



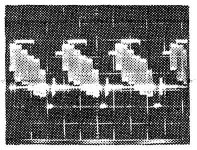
V: 0.5V/div.
H: 20 µsec/div.

🄴 TW14, Emitter F-8
(SECAM)



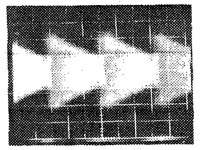
V: 0.2V/div.
H: 20 µsec/div.

🄵 TW14, Emitter F-8
(PAL)



V: 0.2V/div.
H: 20 µsec/div.

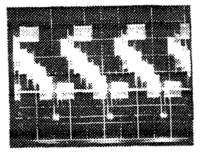
🄶 IF module, Pin ① F-4
(SECAM)



V: 10mV/div.
H: 20 µsec/div.

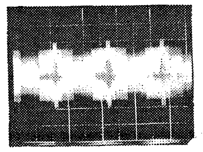
(PIF V-170F/180F)

🄰 IF module, Pin ⑥
(SECAM) F-5



V: 0.5V/div.
H: 20 µsec/div.

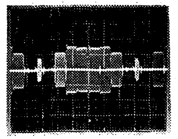
🄷 IF module, Pin ①
(PAL) F-4



V: 10mV/div.
H: 20 µsec/div.

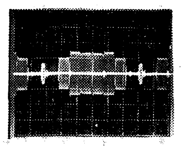
(CHV REC mode)

[1] IC01, Pin ③ F-7
(PAL)



V: 0.05V/div.
H: 10 µs/div.

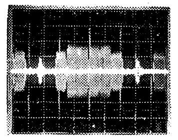
[2] IC01, Pin ㉓ F-4
(PAL)



V: 0.2V/div.
H: 10 µs/div.

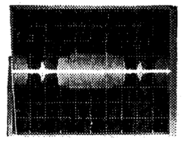
(CHV PLAY mode)

[3] IC01, Pin ⑦ E-7
(PAL)



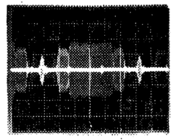
V: 0.1V/div.
H: 10 µs/div.

[4] IC01, Pin ⑤ F-7
(PAL)



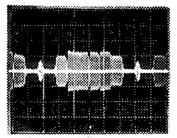
V: 0.5V/div.
H: 10 µ/div.

[5] IC01, Pin ③ F-7
(PAL)



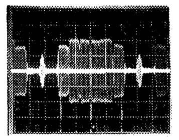
V: 0.1V/div.
H: 10 µ/div.

[6] IC01, Pin ㉔ G-4
(PAL)



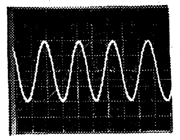
V: 0.1V/div.
H: 10 µs/div.

[7] IC01, Pin ㉓ G-4
(PAL)



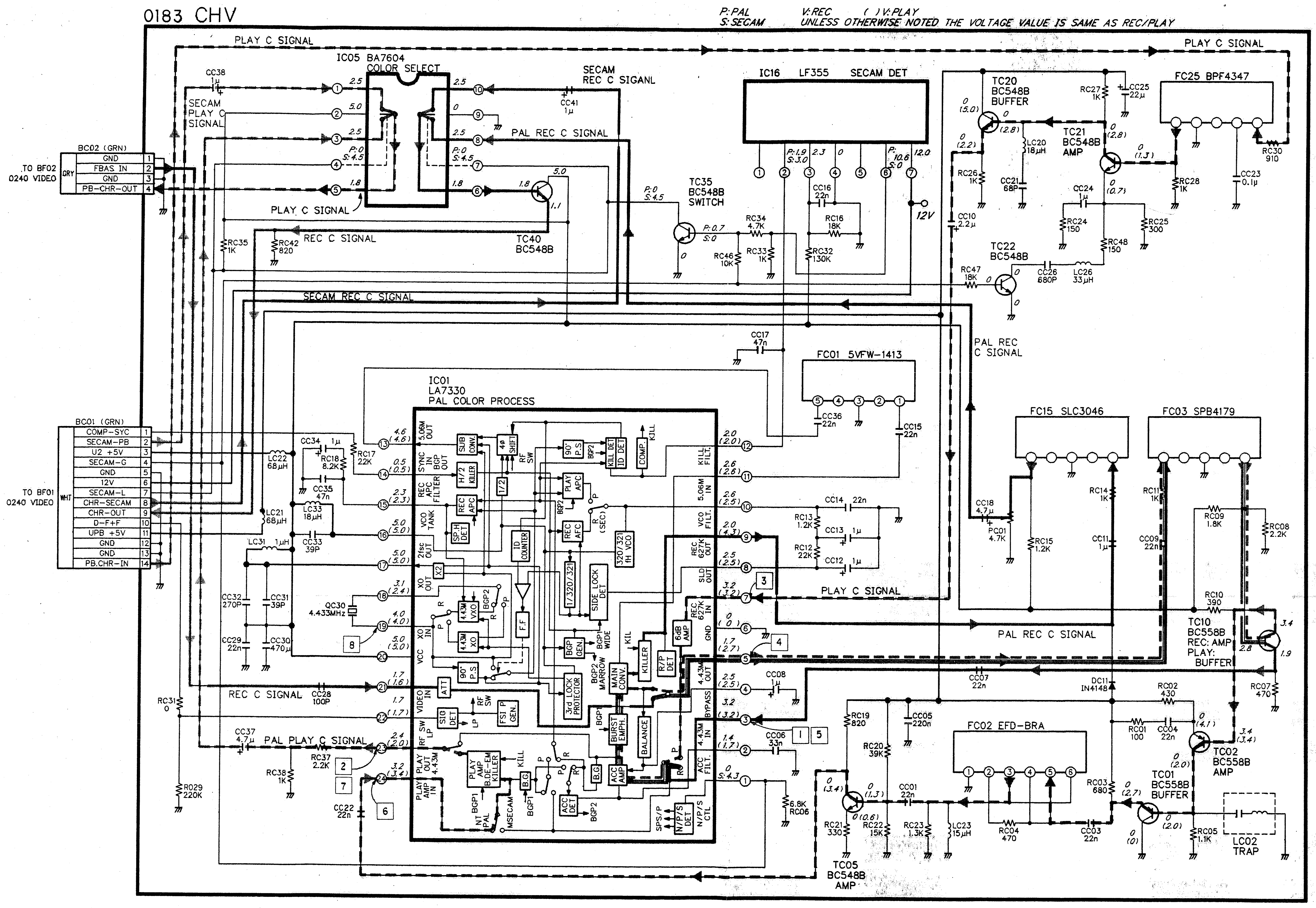
V: 0.2V/div.
H: 10 µs/div.

[8] IC01, Pin ⑲ F-4
(PAL)

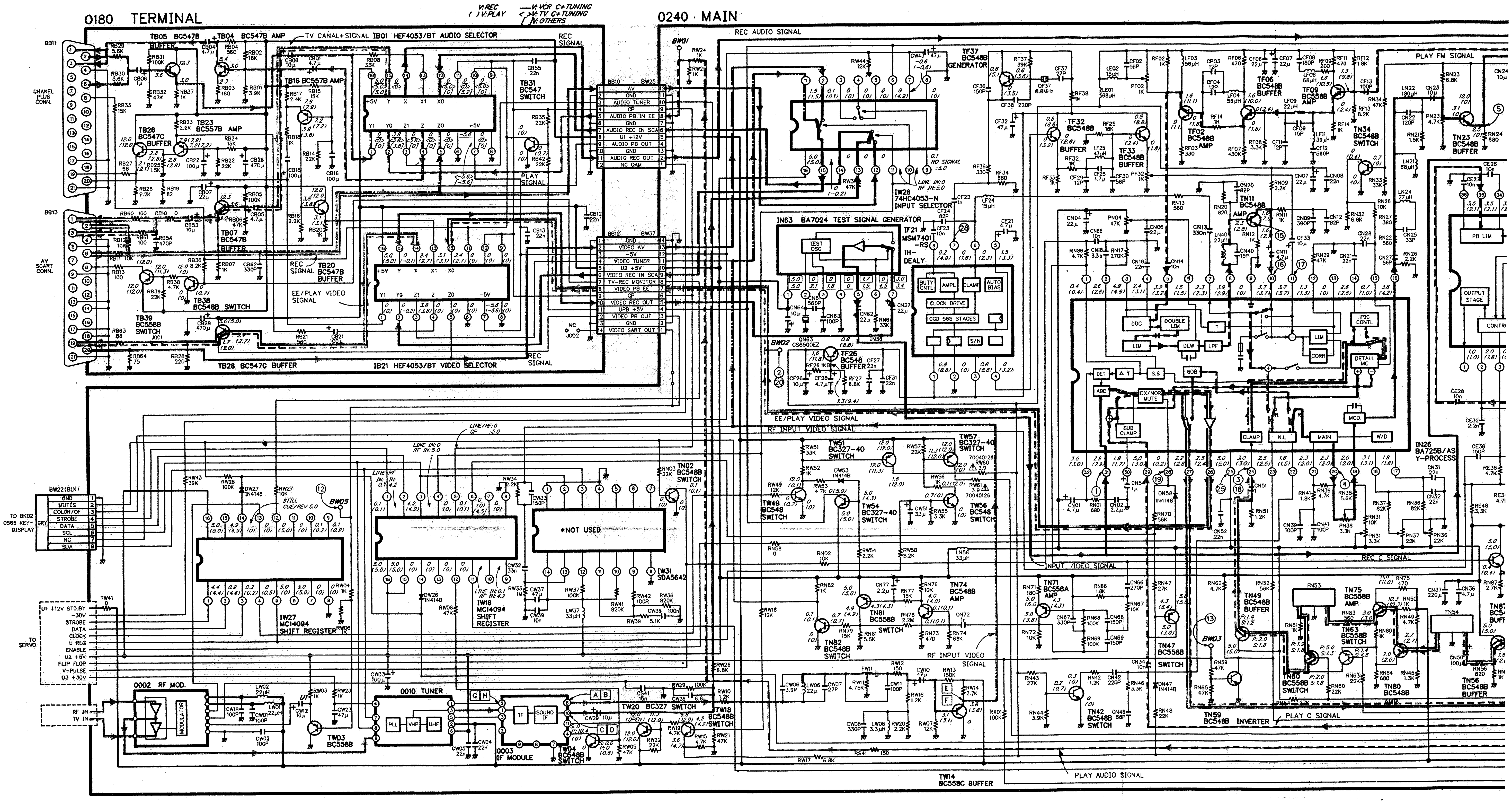


V: 0.1V/div.
H: 10 µs/div.

8-3-(2). CHV Circuit Diagram


0183 CHV
P:PAL V:REC ( ) V:PLAY
S:SECAM UNLESS OTHERWISE NOTED THE VOLTAGE VALUE IS SAME AS REC/PLAY
PLAY C SIGNAL
IC05 BA7604 COLOR SELECT
CC38 1μ
SECAM PLAY C SIGNAL
SECAM REC C SIGANL
CC41 1μ
PAL REC C SIGNAL
IC16 LF355 SECAM DET
12V
TC20 BC548B BUFFER
TC21 BC548B AMP
RC27 1K
CC25 22μ
FC25 BPF4347
RC30 910
CC23 0.1μ
RC28 1K
RC26 1K
LC20 18μH
CC21 68P
CC24 1μ
RC24 150
RC25 300
RC48 150
CC10 2.2μ
TC22 BC548B
RC47 18K
CC26 680P
LC26 33μH
BC02 (GRN)
TO BF02 0240 VIDEO
GRY
GND
FBAS IN
GND
PB-CHR-OUT
TC40 BC548B
TC35 BC548B SWITCH
RC34 4.7K
RC46 10K
RC33 1K
CC16 22n
RC16 18K
RC32 130K
RC35 1K
RC42 820
REC C SIGNAL
SECAM REC C SIGNAL
PAL REC C SIGNAL
CC17 47n
FC01 5VFW-1413
CC36 22n
CC15 22n
IC01 LA7330 PAL COLOR PROCESS
BC01 (GRN)
TO BF01 0240 VIDEO
WHT
COMP-SYC
SECAM-PB
U2 +5V
SECAM-G
GND
12V
SECAM-L
CHR-SECAM
CHR-OUT
D-F+F
UPB +5V
GND
GND
PB.CHR-IN
LC22 68μH
CC34 1μ
RC18 8.2K
RC17 22K
CC35 47n
LC21 68μH
LC33 18μH
LC31 1μH
CC33 39P
CC32 270P
CC31 39P
QC30 4.433MHz
CC29 22n
CC30 470μ
RC31 0
CC28 100P
CC37 4.7μ
PAL PLAY C SIGNAL
RC37 2.2K
RC38 1K
RC029 220K
CC22 22n
5.06M OUT
SYNC IN
BGP OUT
REC APC FILTER
VCO TANK
2fsc OUT
XO OUT
XO IN
VCC
VIDEO IN
RF SW LP
PLAY AMP OUT 4.43M
PLAY AMP IN
SUB CONV.
4φ SHIFT
RF SW
90° P.S
KILL DET
ID DET
COMP.
KILL
H/2 KILLER
PLAY APC
REC APC
1/2
SP.H DET
ID COUNTER
REC AFC
320/321 1H VCO
4.43M VXO
4.43M XO
1/320/321
SIDE LOCK DET
F.F
BGP GEN.
BGP1 WIDE
BGP2 MARROW
MAIN CONV.
KILLER
R/P DET
6dB AMP
3rd LOCK PROTECTOR
BURST EMPH.
BALANCE
ATT
SIG DET
FSI P GEN.
PLAY AMP B.DE-EM KILLER
B.G
ACC DET
ACC AMP
NT PAL
MSECAM
N/P/S DET
SPS/P
KILL FILT.
5.06M IN
VCO FILT.
REC 627K OUT
SLD OUT
REC 627K IN
GND
4.43M OUT
BYPASS
4.43M IN
ACC FILT.
N/P/S CTL
CC14 22n
RC13 1.2K
CC13 1μ
RC12 22K
CC12 1μ
CC08 1μ
CC06 33n
6.8K RC06
FC15 SLC3046
FC03 SPB4179
CC18 4.7μ
PC01 4.7K
RC15 1.2K
RC14 1K
CC11 1μ
RC11 1K
RC09 1.8K
RC08 2.2K
CC09 22n
RC10 390
TC10 BC558B REC: AMP PLAY: BUFFER
PAL REC C SIGNAL
CC07 22n
DC11 IN4148
RC02 430
RC07 470
RC19 820
CC05 220n
FC02 EFD-BRA
RC01 100
CC04 22n
TC02 BC558B AMP
RC20 39K
TC01 BC558B BUFFER
RC03 680
CC01 22n
RC21 330
RC22 15K
RC23 1.3K
LC23 15μH
RC04 470
CC03 22n
RC05 1.1K
LC02 TRAP
TC05 BC548B AMP
1 2 3 4 5 6 7 8 9 10 11
A B C D E F G

8-3-(3). Main (PIF, Video, Audio) Circuit Diagram (V-170F, V-180F)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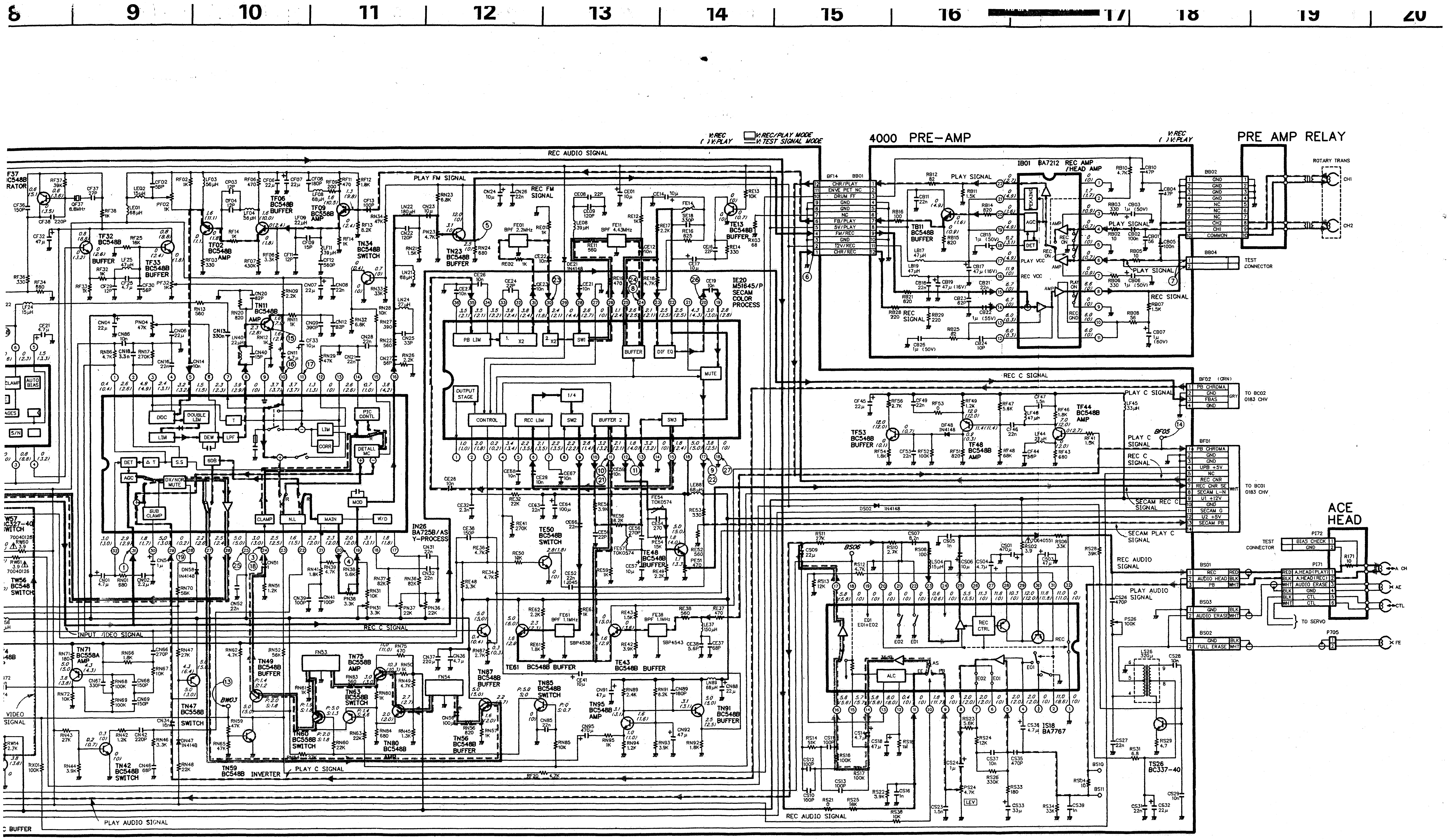
12
A
B
C
D
E
F
G
0180 TERMINAL
0240 MAIN
V:REC
( ) V:PLAY
—V: VCR C+TUNING
< > V: TV C+TUNING
[ ] V: OTHERS
TB05 BC547B BUFFER
TB04 BC547B AMP
TV CANAL+SIGNAL IB01 HEF4053/BT AUDIO SELECTOR
REC SIGNAL
TB16 BC557B AMP
TB31 BC547 SWITCH
PLAY SIGNAL
TB26 BC547C BUFFER
TB23 BC557B AMP
TB07 BC547B BUFFER
TB20 BC547B BUFFER
REC SIGNAL
EE/PLAY VIDEO SIGNAL
TB38 BC548B SWITCH
TB39 BC558B SWITCH
TB28 BC547C BUFFER
IB21 HEF4053/BT VIDEO SELECTOR
REC SIGNAL
CHANEL PLUS CONN.
AV SCART CONN.
BB11
BB13
BB10
BW25
BB12
BW37
AV
GND
AUDIO TUNER
CP
AUDIO PB IN EE
AUDIO REC IN SCA
U1 +12V
AUDIO PB OUT
AUDIO REC OUT
NC CAM
VIDEO AV
-5V
VIDEO TUNER
U2 +5V
VIDEO REC IN SCA
TV-REC MONITOR
VIDEO PB EE
VIDEO REC OUT
UPB +5V
VIDEO PB OUT
VIDEO SART OUT
REC AUDIO SIGNAL
TF37 BC548B GENERATOR
IW28 74HC4053-N INPUT SELECTOR
IN63 BA7024 TEST SIGNAL GENERATOR
TEST OSC
IF21 MSM7401 -RS
1H-DEALY
BUTY CNTL
AMPL
CLAMP
AUTO BIAS
CLOCK DRIVE
CCD 665 STAGES
S/N
BW02
TF26 BC548 BUFFER
EE/PLAY VIDEO SIGNAL
RF INPUT VIDEO SIGNAL
TF32 BC548B BUFFER
TF33 BC548B BUFFER
TF02 BC548B AMP
TF06 BC548B BUFFER
TF09 BC558B AMP
TN11 BC548B AMP
TN34 BC548B SWITCH
TN23 BC548B BUFFER
PLAY FM SIGNAL
PB LIM
OUTPUT STAGE
CONTR
DDC
DOUBLE LIM
LIM
DEW
LPF
PIC CONTL
CORR
DETAIL MC
DET
AGC
DX/NOR MUTE
SUB CLAMP
CLAMP
N.L
MAIN
MOD
W/D
IN26 BA7258/AS Y-PROCESS
BW22(BLK)
GND
MUTES
COLOR/OF
STROBE
DATA
SCL
NC
SDA
TO BK02 0565 KEY-DISPLAY
IW27 MC14094 SHIFT REGISTER
IW18 MC14094 SHIFT REGISTER
*NOT USED
IW31 SDA5642
TN02 BC548B SWITCH
BW05
LINE IN: 0 RF IN: 5.0
LINE/RF: 0 CP
STILL CUE/REV: 5.0
U1 +12V STD.BY
-30V
STROBE
DATA
CLOCK
U REG
ENABLE
FLIP FLOP
V-PULSE
U2 +5V
U3 +30V
TO SERVO
0002 RF MOD.
MODULATOR
RF IN
TV IN
TW03 BC558B
0010 TUNER
PLL
VHF
UHF
0003 IF MODULE
IF
SOUND IF
TW04 BC548B SWITCH
TW20 BC327 SWITCH
TW18 BC548B SWITCH
TW14 BC558C BUFFER
TW51 BC327-40 SWITCH
TW57 BC327-40 SWITCH
TW49 BC548 SWITCH
TW54 BC327-40 SWITCH
TW56 BC548 SWITCH
TN81 BC558B SWITCH
TN82 BC548B SWITCH
TN74 BC548B AMP
RF INPUT VIDEO SIGNAL
TN71 BC558A AMP
TN47 BC558B SWITCH
TN42 BC548B SWITCH
TN49 BC548B BUFFER
TN59 BC548B INVERTER
TN60 BC558B SWITCH
TN63 BC558B SWITCH
TN75 BC558B AMP
TN80 BC548B AMP
TN56 BC548B BUFFER
INPUT VIDEO SIGNAL
REC C SIGNAL
PLAY C SIGNAL
PLAY AUDIO SIGNAL
BW03
FN53
FN54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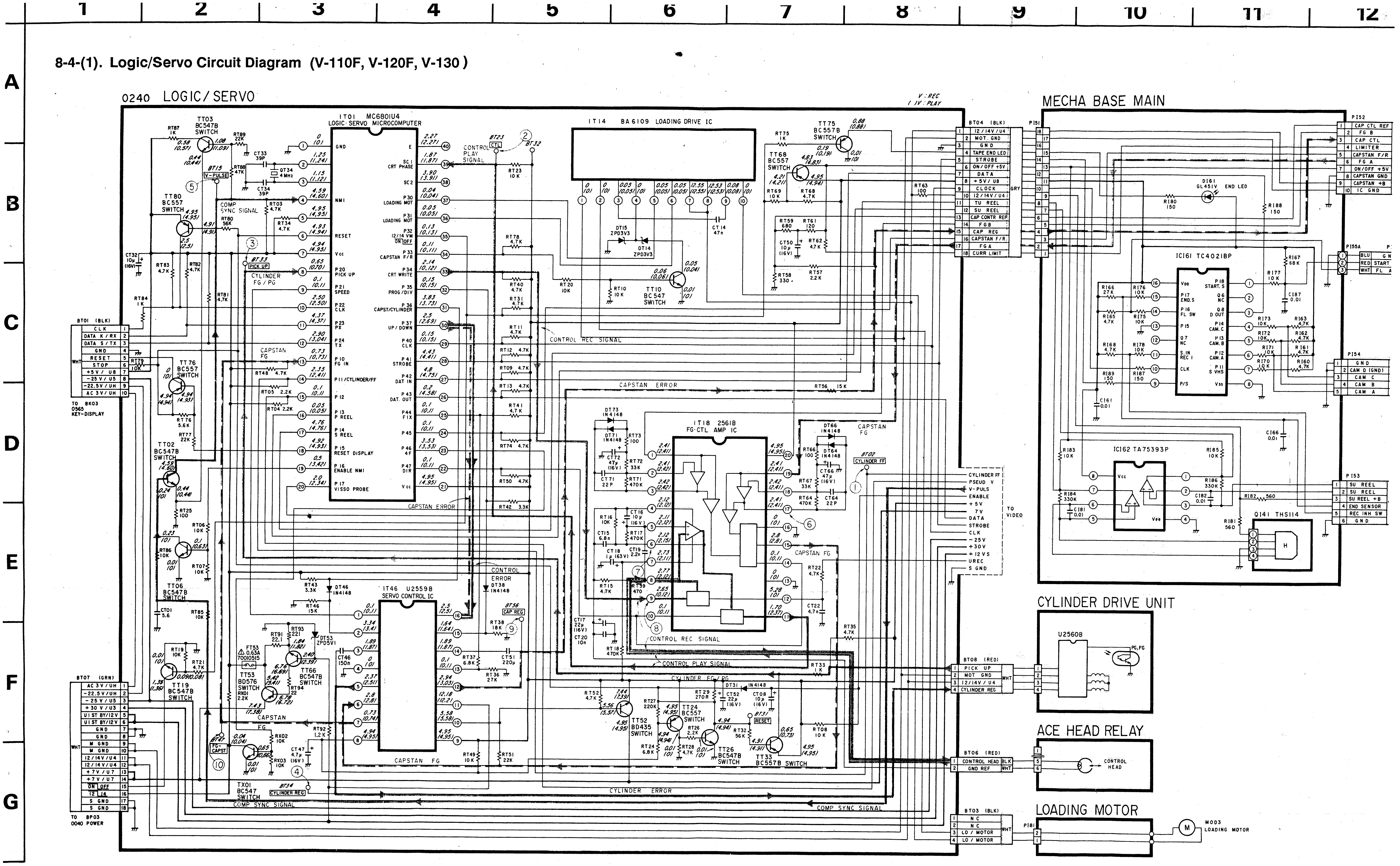
18
19
20
REC AUDIO SIGNAL
PLAY FM SIGNAL
REC FM SIGNAL
V:REC / V:PLAY
V:REC/PLAY MODE
V:TEST SIGNAL MODE
4000 PRE-AMP
PRE AMP RELAY
ROTARY TRANS
CH1
CH2
IB01 BA7212 REC AMP /HEAD AMP
PLAY SIGNAL
REC SIGNAL
TEST CONNECTOR
TF32 BC548B BUFFER
TF33 BC548B BUFFER
TF02 BC548B AMP
TF06 BC548B BUFFER
TF09 BC558B AMP
TN34 BC548B SWITCH
TN23 BC548B BUFFER
TN11 BC548B AMP
TE13 BC548B BUFFER
TB11 BC548B BUFFER
IE20 M51645/P SECAM COLOR PROCESS
IN26 BA725B/AS Y-PROCESS
PB LIM
X2
SW1
BUFFER
DIF EQ
MUTE
OUTPUT STAGE
CONTROL
REC LIM
1/4
SW2
BUFFER 2
SW3
DOC
DOUBLE LIM
LIM
DEW
LPF
PIC CONTL
CORR
DETAIL MC
DET
AGC
DX/NOR MUTE
SUB CLAMP
CLAMP
N.L
MAIN
MOD
W/D
S.S
6DB
REC C SIGNAL
PLAY C SIGNAL
INPUT VIDEO SIGNAL
PLAY AUDIO SIGNAL
VIDEO SIGNAL
C BUFFER
TN71 BC558A AMP
TN42 BC548B SWITCH
TN47 BC558B SWITCH
TN49 BC548B BUFFER
TN60 BC558B SWITCH
TN63 BC558B SWITCH
TN75 BC558B AMP
TN80 BC548B AMP
TN56 BC548B BUFFER
TN87 BC548B BUFFER
TN59 BC548B INVERTER
TN85 BC548B SWITCH
TN95 BC548B AMP
TN91 BC548B BUFFER
TE50 BC548B SWITCH
TE48 BC548B BUFFER
TE61 BC548B BUFFER
TE43 BC548B BUFFER
FN53
FN54
TF53 BC548B BUFFER
TF48 BC548B AMP
TF44 BC548B AMP
BFD2 (GRN)
PB CHROMA
GND
FBAS
TO BC02 0183 CHV
BFD1
UPB +5V
NC
REC CNR
REC CNR SE
SECAM L-N
U1 +12V
SECAM G
U2 +5V
SECAM PB
TO BC01 0183 CHV
PLAY C SIGNAL
REC C SIGNAL
SECAM REC C SIGNAL
SECAM PLAY C SIGNAL
ACE HEAD
BIAS CHECK
A.HEAD(PLAY)
A.HEAD(REC)
AUDIO ERASE
CTL
TO SERVO
A CH
AE
CTL
FE
BS01
REC
AUDIO HEAD
PB
BS03
AUDIO ERASE
BS02
FULL ERASE
REC AUDIO SIGNAL
PLAY AUDIO SIGNAL
IS18 BA7767
REC CTRL
ALC
TS26 BC337-40
BS06
LEV
BF14
BB01
CHR/PLAY
ENVE PET NC
DRUM FF
FB/PLAY
5V/PLAY
FM/REC
12V/REC
CHR/REC
BB02
COMMON
BB04
BF05

8-4-(1). Logic/Servo Circuit Diagram (V-110F, V-120F, V-130)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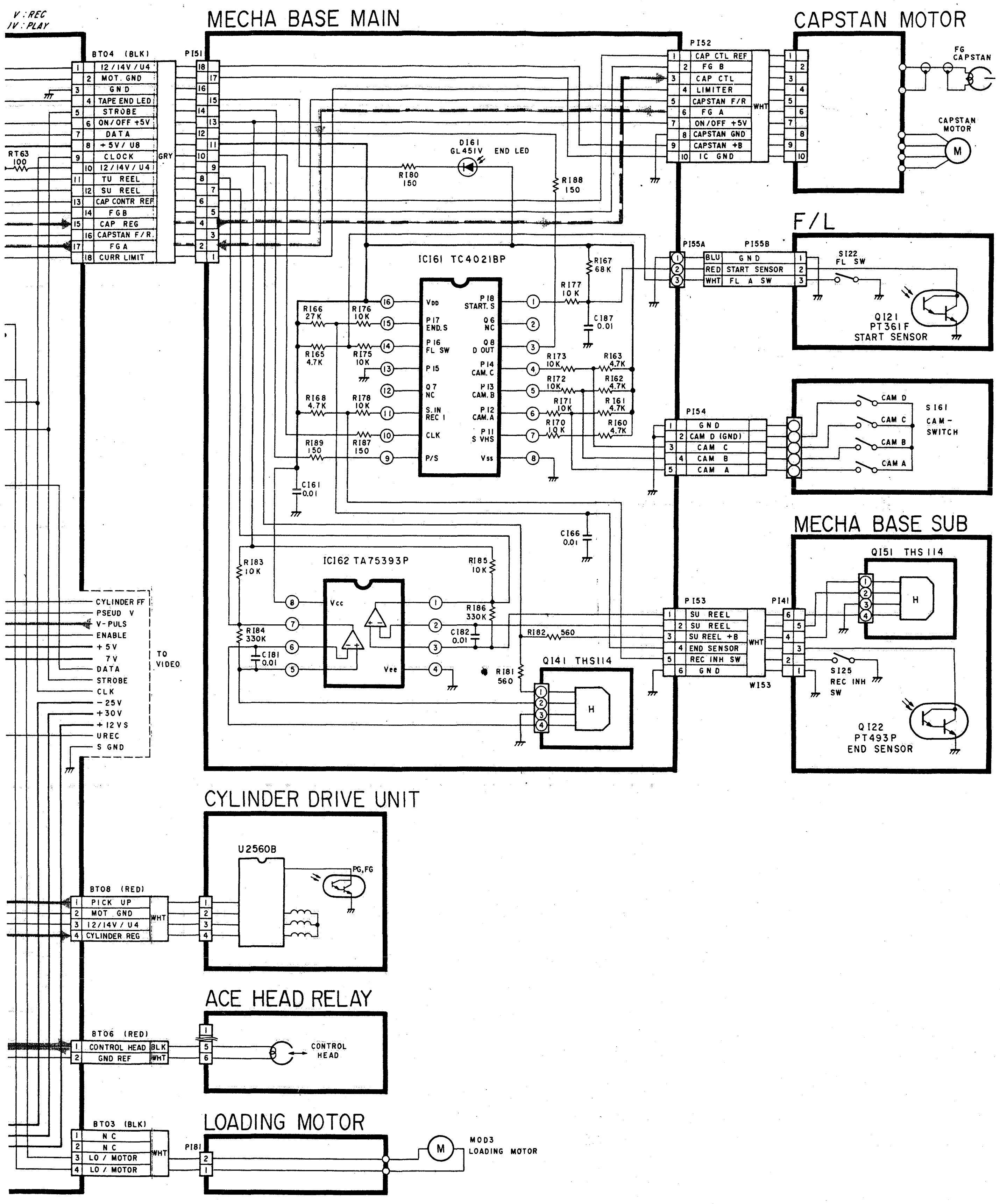
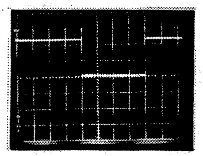
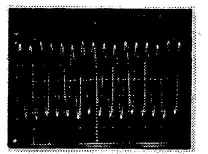
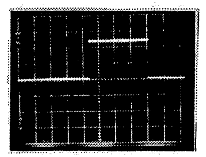
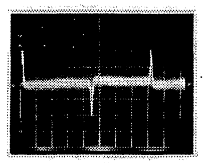
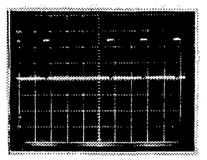
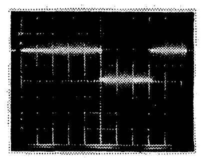
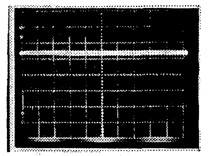
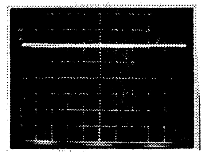
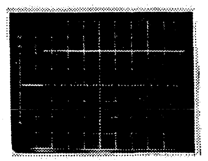
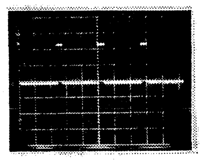
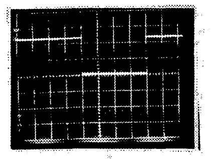
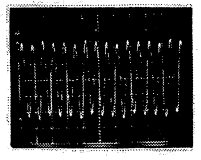
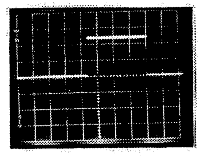
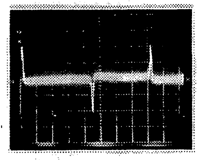
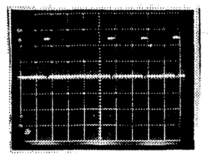
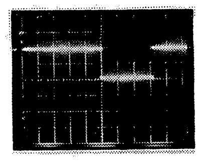
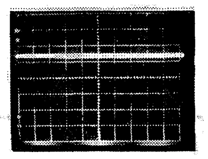
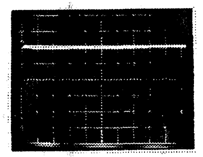
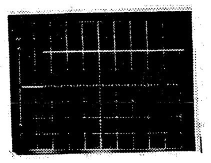
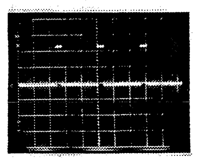
0240 LOGIC/SERVO
IT01 MC6801U4
LOGIC·SERVO MICROCOMPUTER
IT14 BA6109 LOADING DRIVE IC
IT18 2561B
FG·CTL AMP IC
IT46 U2559B
SERVO CONTROL IC
MECHA BASE MAIN
IC161 TC4021BP
IC162 TA75393P
Q141 THS114
CYLINDER DRIVE UNIT
U2560B
ACE HEAD RELAY
LOADING MOTOR
M003
LOADING MOTOR
CONTROL HEAD
BT01 (BLK)
TO BK03
0565
KEY-DISPLAY
BT07 (GRN)
TO BP03
0040 POWER
BT04 (BLK)
BT08 (RED)
BT06 (RED)
BT03 (BLK)
P152
P151
P155A
P154
P153
P181
TO VIDEO
V: REC
/ IV: PLAY
CONTROL PLAY SIGNAL
CONTROL REC SIGNAL
CAPSTAN ERROR
CONTROL ERROR
CYLINDER ERROR
COMP SYNC SIGNAL
CYLINDER FG/PG
CAPSTAN FG
CAPSTAN
FG
CYLINDER FG/PG
D161
GL451V
END LED
FT53
0.63A
70010515


V: REC
/V: PLAY
MECHA BASE MAIN
BT04 (BLK)
P151
1 12/14V/U4
2 MOT. GND
3 GND
4 TAPE END LED
5 STROBE
6 ON/OFF +5V
7 DATA
8 +5V/U8
9 CLOCK
10 12/14V/U4
11 TU REEL
12 SU REEL
13 CAP CONTR REF
14 FGB
15 CAP REG
16 CAPSTAN F/R
17 FGA
18 CURR LIMIT
GRY
RT63 100
D161 GL451V END LED
R180 150
R188 150
IC161 TC4021BP
IC162 TA75393P
R166 27K
R176 10K
R165 4.7K
R175 10K
R168 4.7K
R178 10K
R189 150
R187 150
C161 0.01
R167 68K
R177 10K
C187 0.01
R173 10K
R163 4.7K
R172 10K
R162 4.7K
R171 10K
R161 4.7K
R170 10K
R160 4.7K
VDD
P18 START.S
P17 END.S
Q6 NC
P16 FL SW
Q8 D OUT
P15
P14 CAM.C
Q7 NC
P13 CAM.B
S.IN REC I
P12 CAM.A
CLK
P11 S VHS
P/S
Vss
C166 0.01
R183 10K
R185 10K
R186 330K
R184 330K
C181 0.01
C182 0.01
R182 560
R181 560
Vcc
Vee
Q141 THS114
CYLINDER FF
PSEUD V
V-PULS
ENABLE
+5V
7V
DATA
STROBE
CLK
-25V
+30V
+12VS
UREC
S GND
TO VIDEO
CAPSTAN MOTOR
P152
1 CAP CTL REF
2 FG B
3 CAP CTL
4 LIMITER
5 CAPSTAN F/R
6 FG A
7 ON/OFF +5V
8 CAPSTAN GND
9 CAPSTAN +B
10 IC GND
WHT
FG CAPSTAN
CAPSTAN MOTOR
M
F/L
P155A
P155B
BLU GND
RED START SENSOR
WHT FL A SW
S122 FL SW
Q121 PT361F START SENSOR
P154
1 GND
2 CAM D (GND)
3 CAM C
4 CAM B
5 CAM A
CAM D
CAM C
CAM B
CAM A
S161 CAM-SWITCH
MECHA BASE SUB
Q151 THS114
H
P153
P141
1 SU REEL
2 SU REEL
3 SU REEL +B
4 END SENSOR
5 REC INH SW
6 GND
WHT
W153
S125 REC INH SW
Q122 PT493P END SENSOR
CYLINDER DRIVE UNIT
U2560B
PG, FG
BT08 (RED)
1 PICK UP
2 MOT GND
3 12/14V/U4
4 CYLINDER REG
WHT
ACE HEAD RELAY
BT06 (RED)
1 CONTROL HEAD
2 GND REF
BLK
WHT
CONTROL HEAD
LOADING MOTOR
BT03 (BLK)
P181
1 NC
2 NC
3 LO/MOTOR
4 LO/MOTOR
WHT
M
MOD3 LOADING MOTOR

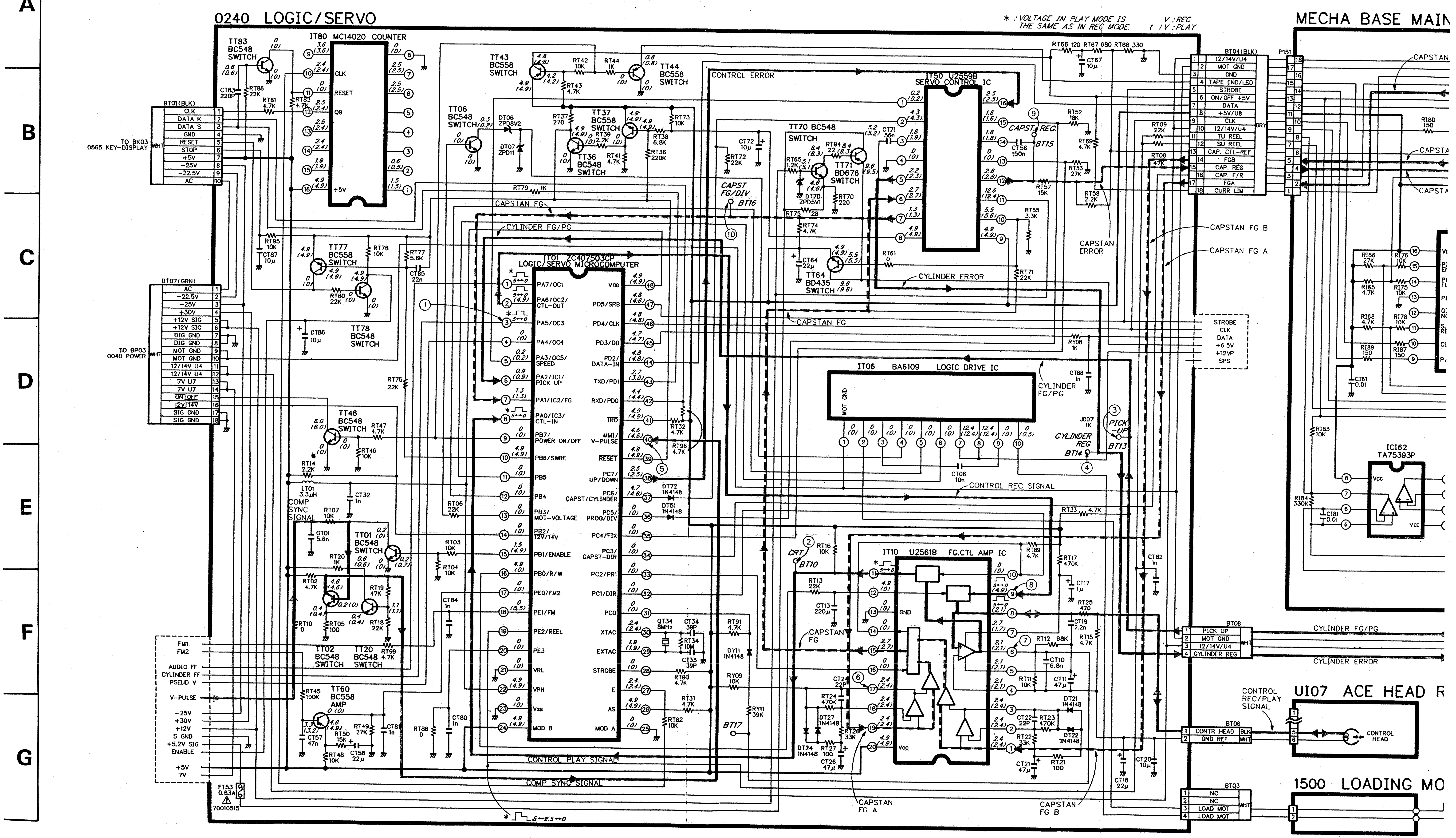
(V110F, V-120F, V-130F)

① BT02 D-8  V: 2V/div. H: 5ms/div.	⑥ IT18, Pin ⑰ E-7  V: 0.2V/div. H: 2ms/div.
② BT23 B-5  V: 2V/div. H: 5ms/div.	⑦ IT18, Pin ⑥ E-6  V: 0.2V/div. H: 5ms/div.
③ BT33 C-3  V:2V/div. H: 5ms/div.	⑧ IT18, Pin ⑨ F-6  V: 2V/div. H: 5ms/div.
④ BT34 G-3  V: 0.5V/div. H: 5ms/div.	⑨ BT56 F-5  V: 0.5V/div. H: 5ms/div.
⑤ BT15 B-2  V: 2V/div. H: 20 μs/div.	⑩ BT47 G-2  V: 2V/div. H: 2ms/div.

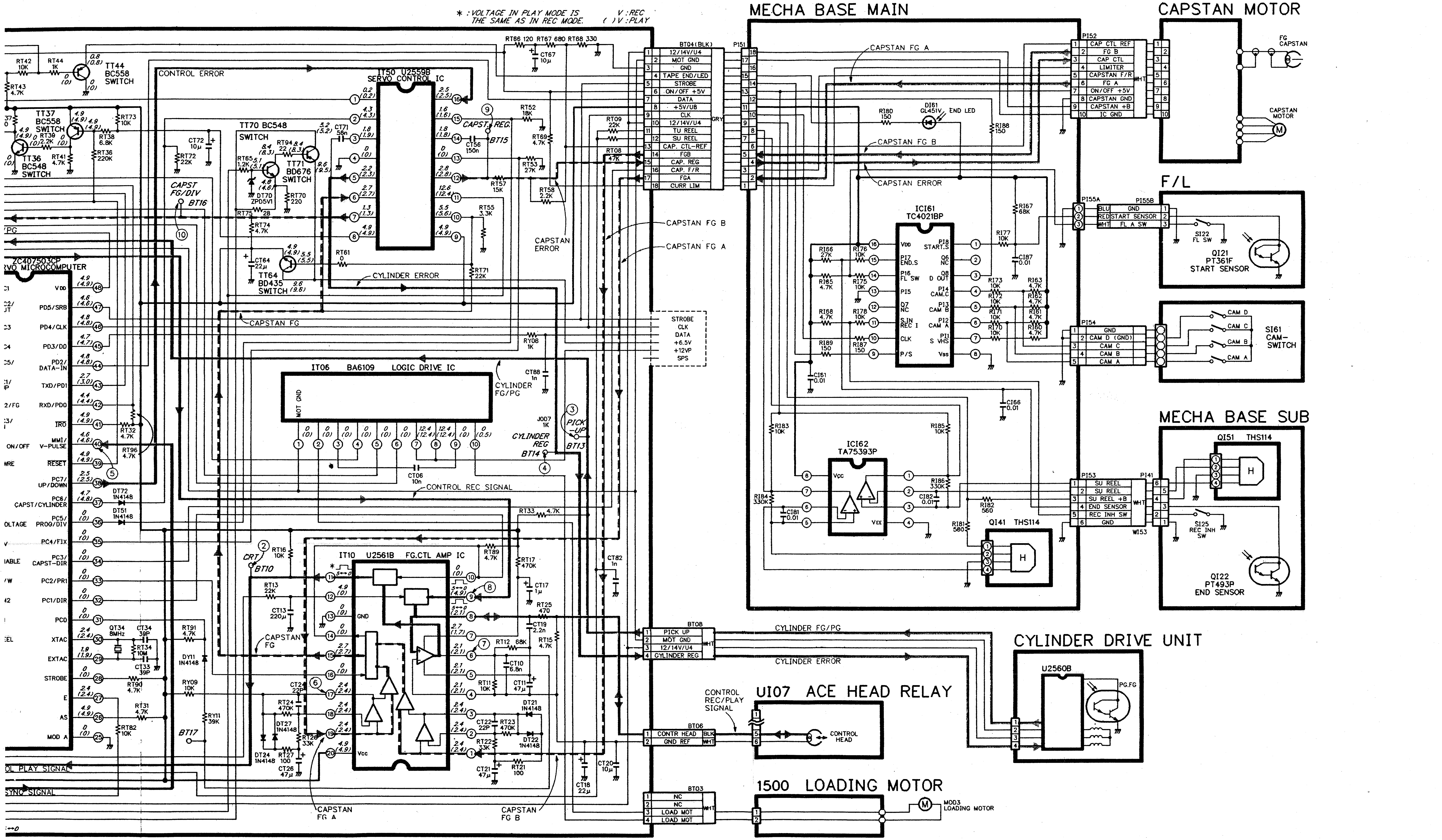
(V170F, V-180F)

① IT01, Pin ③ C-4 	⑥ IT10, Pin ⑰ F-7 
② BT10 E-7 	⑦ IT10, Pin ⑥ F-9 
③ BT13 D-9 	⑧ IT10, Pin ⑨ F-9 
④ BT14 E-9 	⑨ BT15 B-9 
⑤ IT01, Pin ㊵ E-6 	⑩ BT16 C-6 

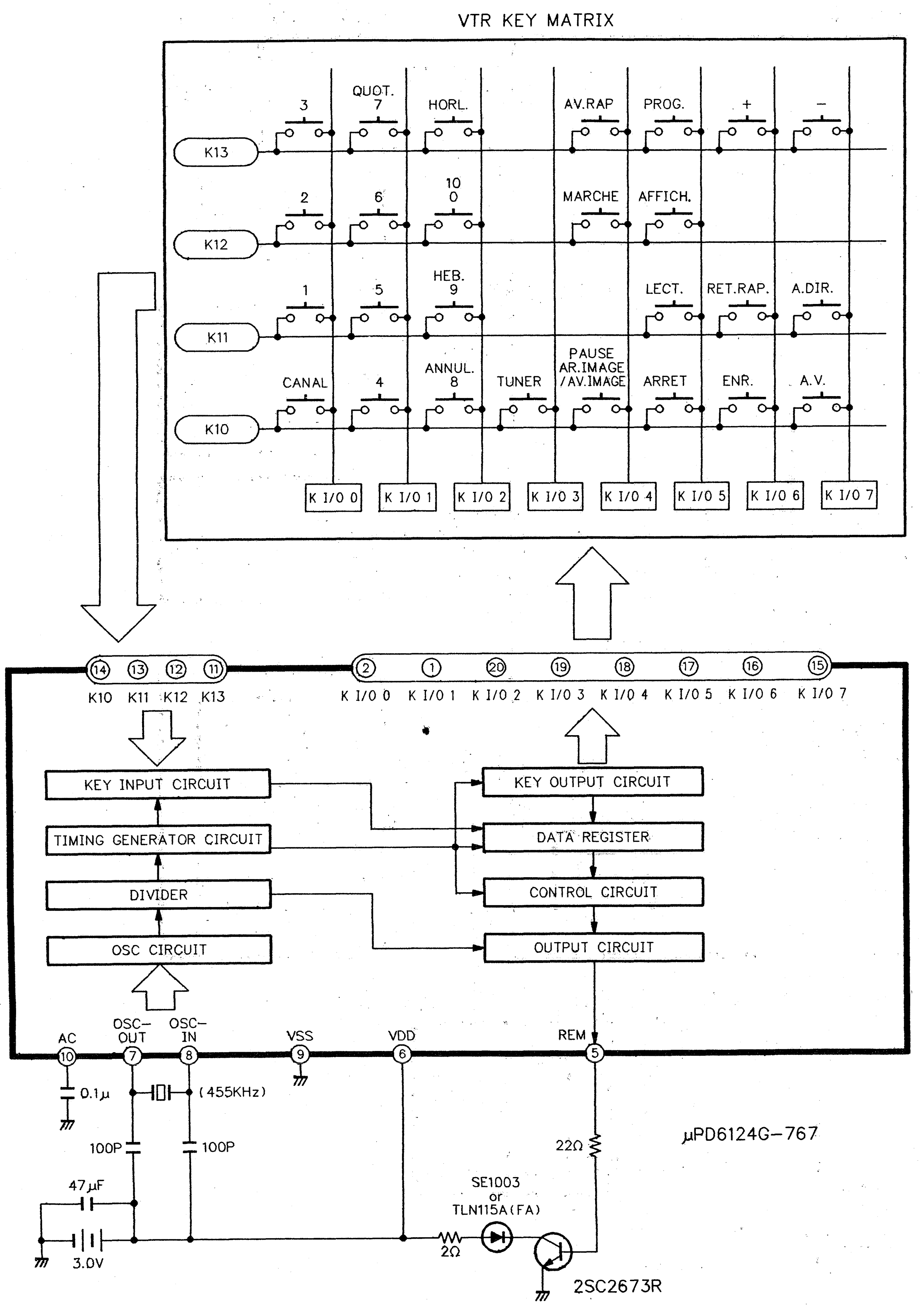
8-4-(2). Logic/Servo Circuit Diagram (V-170F, V-180F)



0240 LOGIC/SERVO
* : VOLTAGE IN PLAY MODE IS THE SAME AS IN REC MODE.
V : REC
( ) V : PLAY
MECHA BASE MAIN
IT80 MC14020 COUNTER
IT01 ZC407503CP LOGIC/SERVO MICROCOMPUTER
IT50 U2559B SERVO CONTROL IC
IT06 BA6109 LOGIC DRIVE IC
IT10 U2561B FG.CTL AMP IC
IC162 TA75393P
TT83 BC548 SWITCH
TT43 BC558 SWITCH
TT44 BC558 SWITCH
TT06 BC548 SWITCH
TT37 BC558 SWITCH
TT36 BC548 SWITCH
TT70 BC548 SWITCH
TT71 BD676 SWITCH
TT64 BD435 SWITCH
TT77 BC558 SWITCH
TT78 BC548 SWITCH
TT46 BC548 SWITCH
TT01 BC548 SWITCH
TT02 BC548 SWITCH
TT20 BC548 SWITCH
TT60 BC558 AMP
BT01(BLK) TO BK03 0565 KEY-DISPLAY
BT07(GRN) TO BP03 0040 POWER
BT04(BLK)
BT08
BT06
BT03
CONTROL ERROR
CAPSTAN FG
CYLINDER FG/PG
CYLINDER ERROR
CAPST FG/DIV
CAPSTAN ERROR
CAPSTAN FG B
CAPSTAN FG A
CONTROL REC SIGNAL
CONTROL PLAY SIGNAL
COMP SYNC SIGNAL
CYLINDER REG
PICK-UP
CRT
CONTROL REC/PLAY SIGNAL
UI07 ACE HEAD
CONTROL HEAD
1500 LOADING MO
FT53 0.63A 70010515

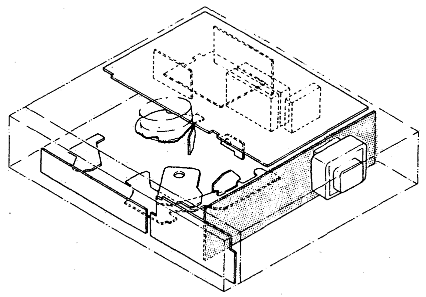

* : VOLTAGE IN PLAY MODE IS THE SAME AS IN REC MODE.
V :REC
( ) V :PLAY
MECHA BASE MAIN
CAPSTAN MOTOR
FG CAPSTAN
CAPSTAN MOTOR
F/L
MECHA BASE SUB
CYLINDER DRIVE UNIT
U2560B
PG.FG
UI07 ACE HEAD RELAY
CONTROL HEAD
CONTROL REC/PLAY SIGNAL
1500 LOADING MOTOR
MOD3 LOADING MOTOR
IT50 U2559B SERVO CONTROL IC
IT06 BA6109 LOGIC DRIVE IC
MOT GND
IT10 U2561B FG.CTL AMP IC
ZC407503CP SERVO MICROCOMPUTER
IC61 TC4021BP
IC62 TA75393P
TT44 BC558 SWITCH
TT37 BC558 SWITCH
TT36 BC548 SWITCH
TT70 BC548 SWITCH
TT71 BD676 SWITCH
TT64 BD435 SWITCH
DT70 ZPD5V1
CONTROL ERROR
CYLINDER ERROR
CAPSTAN FG
CAPSTAN FG A
CAPSTAN FG B
CAPSTAN ERROR
CAPST FG/DIV
CAPST. REG.
CYLINDER FG/PG
CYLINDER REG
PICK-UP
CONTROL REC SIGNAL
CRT
BT04 (BLK)
1 12/14V/U4
2 MOT GND
3 GND
4 TAPE END/LED
5 STROBE
6 ON/OFF +5V
7 DATA
8 +5V/UB
9 CLK
10 12/14V/U4
11 TU REEL
12 SU REEL
13 CAP. CTL-REF
14 FGB
15 CAP. REG
16 CAP. F/R
17 FGA
18 CURR LIM
GRY
PI51
PI52
1 CAP CTL REF
2 FG B
3 CAP CTL
4 LIMITER
5 CAPSTAN F/R
6 FG A
7 ON/OFF +5V
8 CAPSTAN GND
9 CAPSTAN +B
10 IC GND
WHT
DI61 GL451V END LED
PI55A PI55B
BLU GND
RED START SENSOR
WHT FL A SW
SI22 FL SW
QI21 PT361F START SENSOR
PI54
GND
CAM D (GND)
CAM C
CAM B
CAM A
SI61 CAM-SWITCH
PI53 PI41
SU REEL
SU REEL
SU REEL +B
END SENSOR
REC INH SW
GND
WI53
QI51 THS114
QI41 THS114
SI25 REC INH SW
QI22 PT493P END SENSOR
STROBE
CLK
DATA
+6.5V
+12VP
SPS
BT08
1 PICK UP
2 MOT GND
3 12/14V/U4
4 CYLINDER REG
CYLINDER FG/PG
CYLINDER ERROR
BT06
1 CONTR HEAD
2 GND REF
BLK
BT03
1 NC
2 NC
3 LOAD MOT
4 LOAD MOT
VDD
PD5/SRB
PD4/CLK
PD3/DO
PD2/DATA-IN
TXD/PD1
RXD/PD0
IRQ
MMI/V-PULSE
RESET
PC7/UP/DOWN
PC6/CAPST/CYLINDER
PC5/PROG/DIV
PC4/FIX
PC3/CAPST-DIR
PC2/PR1
PC1/DIR
PCO
XTAC
EXTAC
STROBE
E
AS
MOD A
ON/OFF
QT34 8MHz
OL PLAY SIGNAL
SYNC SIGNAL
BT10 BT13 BT14 BT15 BT16 BT17
J007 1K
START.S
END.S
FL SW
D OUT
CAM.C
CAM B
CAM A
S VHS
REC I
P/S
Vss
Vcc
VEE
GND

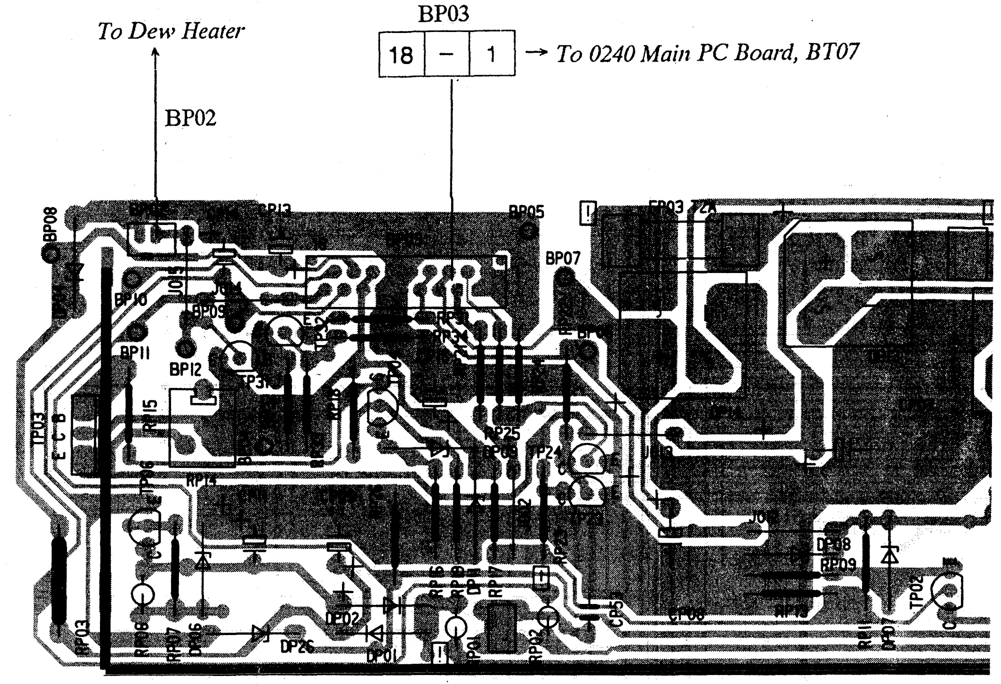
8-5. Remote Control Circuit Diagram


VTR KEY MATRIX
K13
K12
K11
K10
3
QUOT. 7
HORL.
AV.RAP
PROG.
+
−
2
6
10 0
MARCHE
AFFICH.
1
5
HEB. 9
LECT.
RET.RAP.
A.DIR.
CANAL
4
ANNUL. 8
TUNER
PAUSE AR.IMAGE /AV.IMAGE
ARRET
ENR.
A.V.
K I/O 0
K I/O 1
K I/O 2
K I/O 3
K I/O 4
K I/O 5
K I/O 6
K I/O 7
⑭ ⑬ ⑫ ⑪
K10 K11 K12 K13
② ① ⑳ ⑲ ⑱ ⑰ ⑯ ⑮
KEY INPUT CIRCUIT
TIMING GENERATOR CIRCUIT
DIVIDER
OSC CIRCUIT
KEY OUTPUT CIRCUIT
DATA REGISTER
CONTROL CIRCUIT
OUTPUT CIRCUIT
AC ⑩
OSC-OUT ⑦
OSC-IN ⑧
VSS ⑨
VDD ⑥
REM ⑤
0.1μ
(455KHz)
100P
100P
47μF
3.0V
22Ω
2Ω
SE1003 or TLN115A(FA)
2SC2673R
μPD6124G−767

9. PC Boards

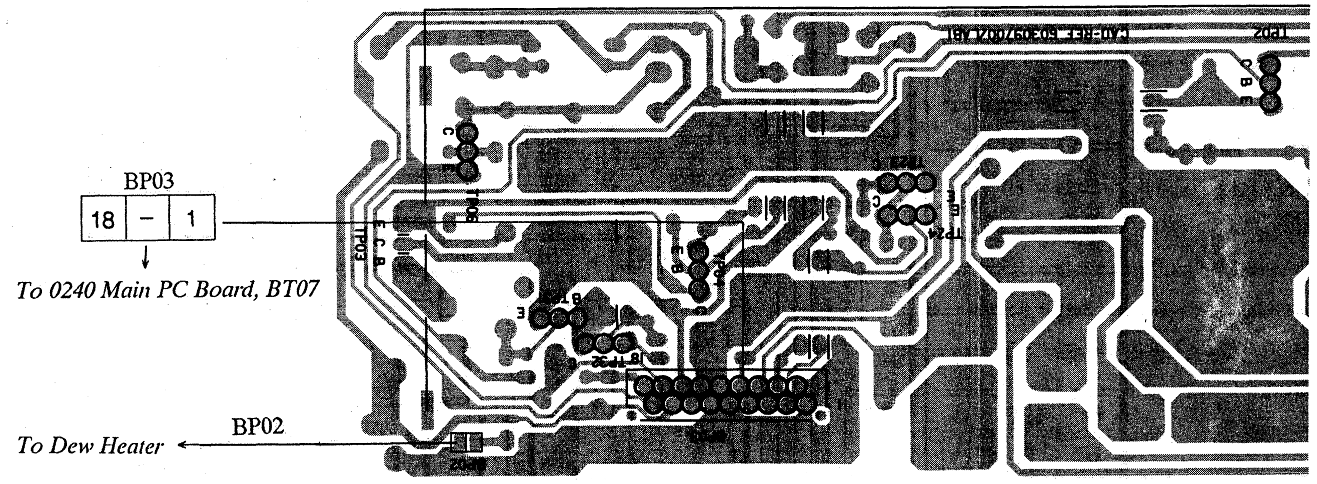
9-1. Power Supply PC Board




To Dew Heater
BP02
BP03
18 − 1
→ To 0240 Main PC Board, BT07
BP08
BP13
BP05
BP07
BP10
BP09
BP11
BP12
TP31
TP03
TP25
TP24
TP06
TP23
TP02
RP14
DP26
DP02
DP01
DP08
DP09
RP01

Location of Diodes

Symbol No.	Location
DP01	A-4
DP02	A-4
DP04	B-3
DP06	A-3
DP07	A-6
DP08	A-6
DP09	B-4
DP11	A-4
DP12	B-7
DP13	B-6
DP14	B-5
DP26	A-4

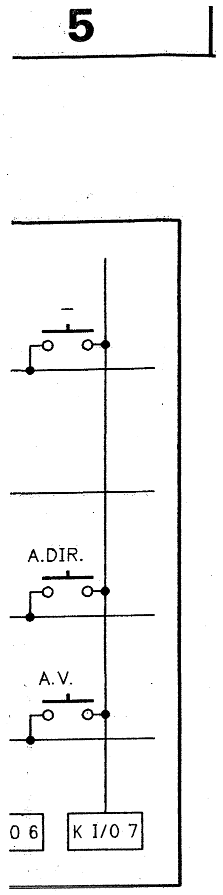

BP03
18 − 1
To 0240 Main PC Board, BT07
BP02
To Dew Heater ←
TP03
E C B

[V]:REC.<V>:CUE.<<V>>:FF/REW

Symbol No.	Voltage(Unit:V)			Location
	E	C	B	
TP01	[20.5]<20.7><<20.6>>	[12.3]<14.4><<14.5>>	[19.8]<20.1><<19.9>>	B-7
TP02	[5.3]<7.4><<7.4>>	[19.8]<20.0><<19.8>>	[5.9]<8.0><<8.0>>	A-6
TP03	[20.3]<20.8><<20.5>>	[12.1]<12.1><<12.1>>	[19.6]<20.1><<19.9>>	B-3
TP04	[5.2]<5.3><<5.3>>	[19.6]<20.1><<19.9>>	[5.9]<5.9><<5.9>>	B-4
TP06	[-23.8]<-23.8><<-23.8>>	[-40.1]<-40.8><<-40.8>>	[-24.4]<-24.4><<-24.4>>	B-3
TP23	[0]<0><<0>>	[0]<8><<8>>	[0.5]<0><<0>>	B-5
TP24	[0]<0><<0>>	[0.5]<0><<0>>	[0]<0.5><<0.5>>	B-5
TP31	[12.1]<12.1><<12.1>>	[0]<0><<0>>	[12.1]<12.1><<12.1>>	B-4
TP32	[12.3]<14.4><<14.4>>	[12.1]<12.1><<12.1>>	[8.8]<8.8><<8.8>>	B-4

V:OFF.(V):E

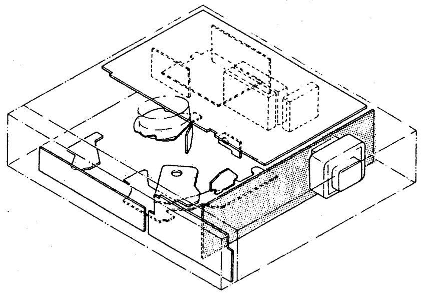
Symbol No.	Voltage(Unit:V)		
	E	C	B
TP01	22.6(21.5){20.8}	1.8(14.5){12.3}	22.1(20.9){20.2}
TP02	0(7.4){5.3}	22.0(20.8){20.2}	0(8.0){5.9}
TP03	21.6(21.2){20.9}	12.0(12.1){12.1}	20.9(20.6){20.3}
TP04	5.2(5.3){5.3}	20.8(20.6){20.2}	5.8(5.9){5.9}
TP06	−23.8(−23.8){−23.8}	−41.6(−41.4){−41.0}	−24.4(−24.4){−24
TP23	0(0){0}	0(8){0}	0(0){0.5}
TP24	0(0){0}	0(0){0.5}	0.5(0.5){0}
TP31	12.1(12.1){12.1}	12.1(0){0}	11.3(12.1){12.1}
TP32	8.1(14.5){12.3}	11.4(12.1){12.1}	8.7(8.8){8.8}


5
A.DIR.
A.V.
0 6
K I/O 7

D

9. PC Boards

9-1. Power Supply PC Board



C

B

A

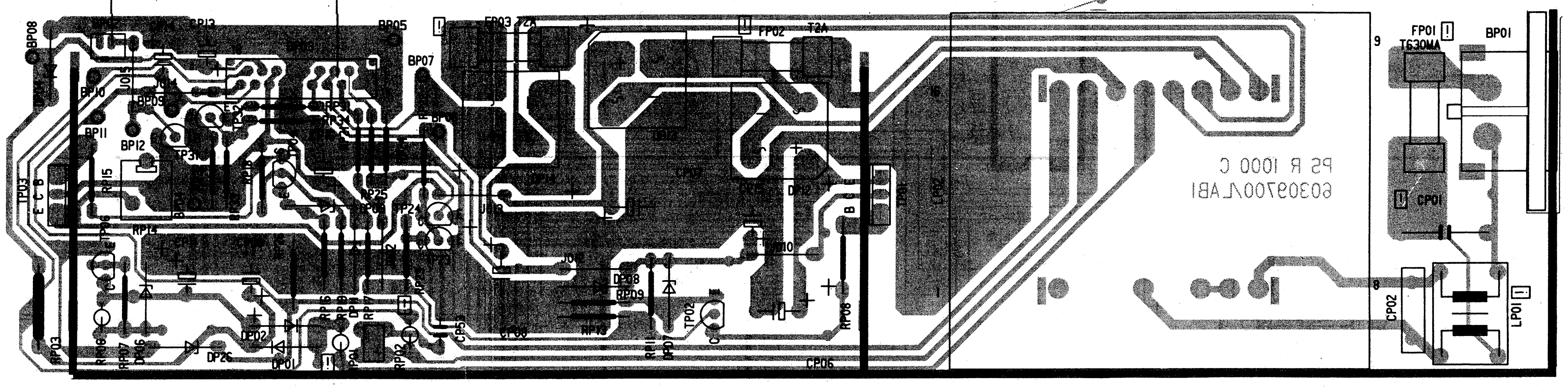
To Dew Heater

BP02

BP03

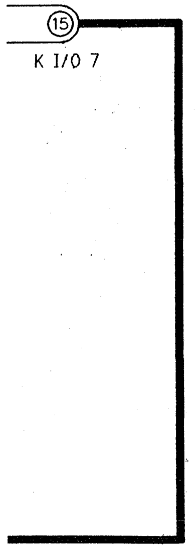
18	–	1

→ To 0240 Main PC Board, BT07


BP08
BP13
BP05
BP07
FP03
T2A
FP02
T2A
FP01
T630MA
BP01
CP01
LP01
CP02
BP10
BP11
BP12
TP03
TP02
CP06
DP26
DP01
DP02
TP01
TP08
9
8

0040 Power PC Board (Top Side)

1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 — 10

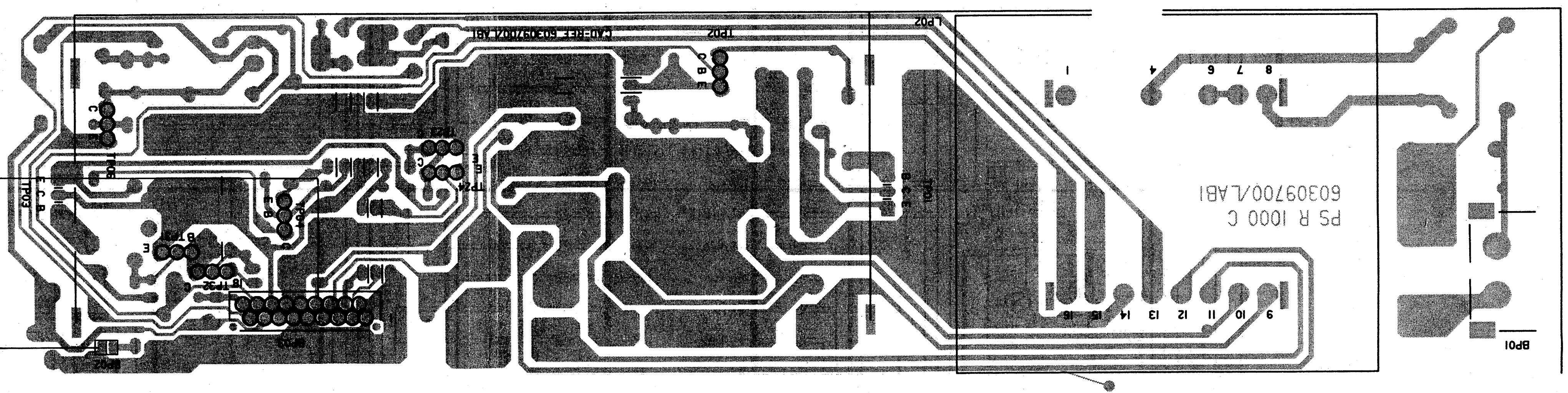


A

B

C

D


TP02
TP01
TP03
BP01
1
4
6
7
8
9
10
11
12
13
14
15
16

0040 Power PC Board (Bottom Side)

BP03

18	–	1

↓

To 0240 Main PC Board, BT07

To Dew Heater ← BP02

Location of Diodes

Symbol No.	Location
DP01	A-4
DP02	A-4
DP04	B-3
DP06	A-3
DP07	A-6
DP08	A-6
DP09	B-4
DP11	A-4
DP12	B-7
DP13	B-6
DP14	B-5
DP26	A-4

[V]:REC.<V>:CUE.<<V>>:FF/REW

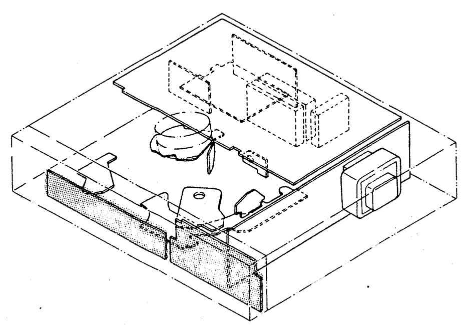
Symbol No.	Voltage(Unit:V)			Location
	E	C	B	
TP01	[20.5]<20.7><<20.6>>	[12.3]<14.4><<14.5>>	[19.8]<20.1><<19.9>>	B-7
TP02	[5.3]<7.4><<7.4>>	[19.8]<20.0><<19.8>>	[5.9]<8.0><<8.0>>	A-6
TP03	[20.3]<20.8><<20.5>>	[12.1]<12.1><<12.1>>	[19.6]<20.1><<19.9>>	B-3
TP04	[5.2]<5.3><<5.3>>	[19.6]<20.1><<19.9>>	[5.9]<5.9><<5.9>>	B-4
TP06	[-23.8]<-23.8><<-23.8>>	[-40.1]<-40.8><<-40.8>>	[-24.4]<-24.4><<-24.4>>	B-3
TP23	[0]<0><<0>>	[0]<8><<8>>	[0.5]<0><<0>>	B-5
TP24	[0]<0><<0>>	[0.5]<0><<0>>	[0]<0.5><<0.5>>	B-5
TP31	[12.1]<12.1><<12.1>>	[0]<0><<0>>	[12.1]<12.1><<12.1>>	B-4
TP32	[12.3]<14.4><<14.4>>	[12.1]<12.1><<12.1>>	[8.8]<8.8><<8.8>>	B-4

V:OFF.(V):EE.{V}:PLAY

Symbol No.	Voltage(Unit:V)			Location
	E	C	B	
TP01	22.6(21.5){20.8}	1.8(14.5){12.3}	22.1(20.9){20.2}	B-7
TP02	0(7.4){5.3}	22.0(20.8){20.2}	0(8.0){5.9}	A-6
TP03	21.6(21.2){20.9}	12.0(12.1){12.1}	20.9(20.6){20.3}	B-3
TP04	5.2(5.3){5.3}	20.8(20.6){20.2}	5.8(5.9){5.9}	B-4
TP06	-23.8(-23.8){-23.8}	-41.6(-41.4){-41.0}	-24.4(-24.4){-24.4}	B-3
TP23	0(0){0}	0(8){0}	0(0){0.5}	B-5
TP24	0(0){0}	0(0){0.5}	0.5(0.5){0}	B-5
TP31	12.1(12.1){12.1}	12.1(0){0}	11.3(12.1){12.1}	B-4
TP32	8.1(14.5){12.3}	11.4(12.1){12.1}	8.7(8.8){8.8}	B-4

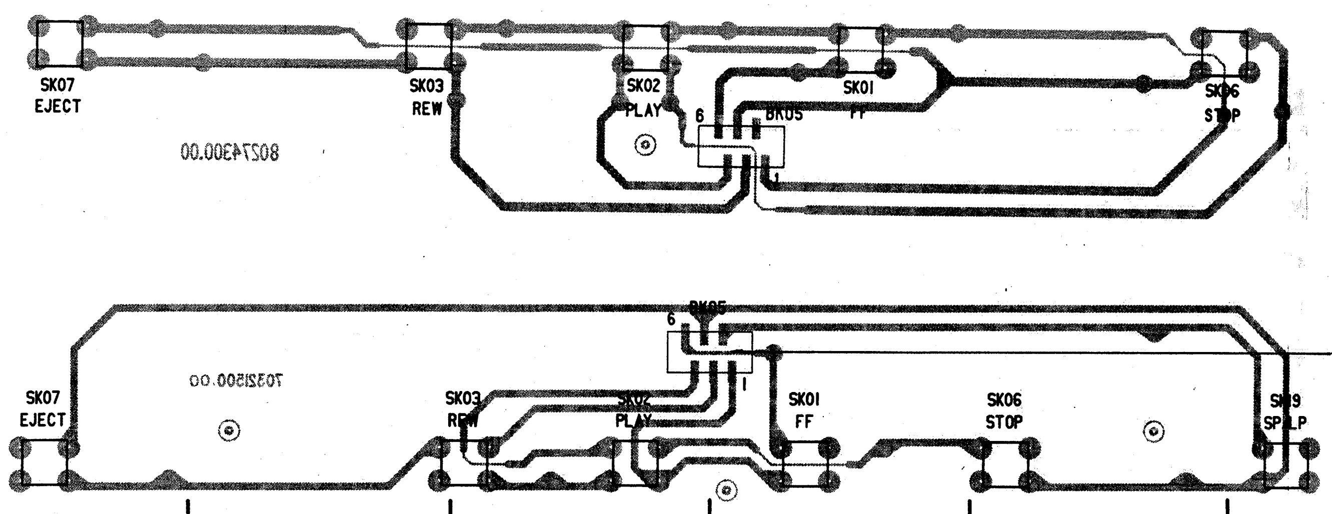
-767

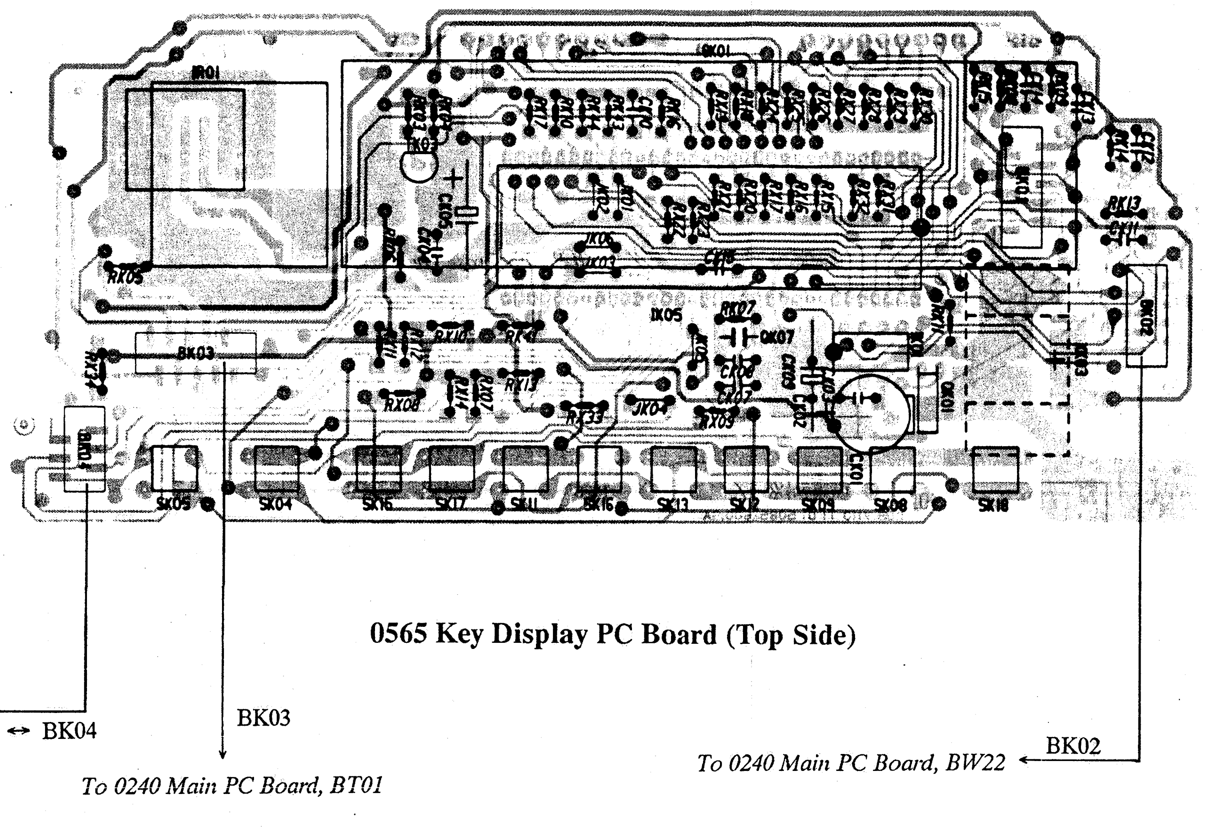
9-2. Key Display PC Board



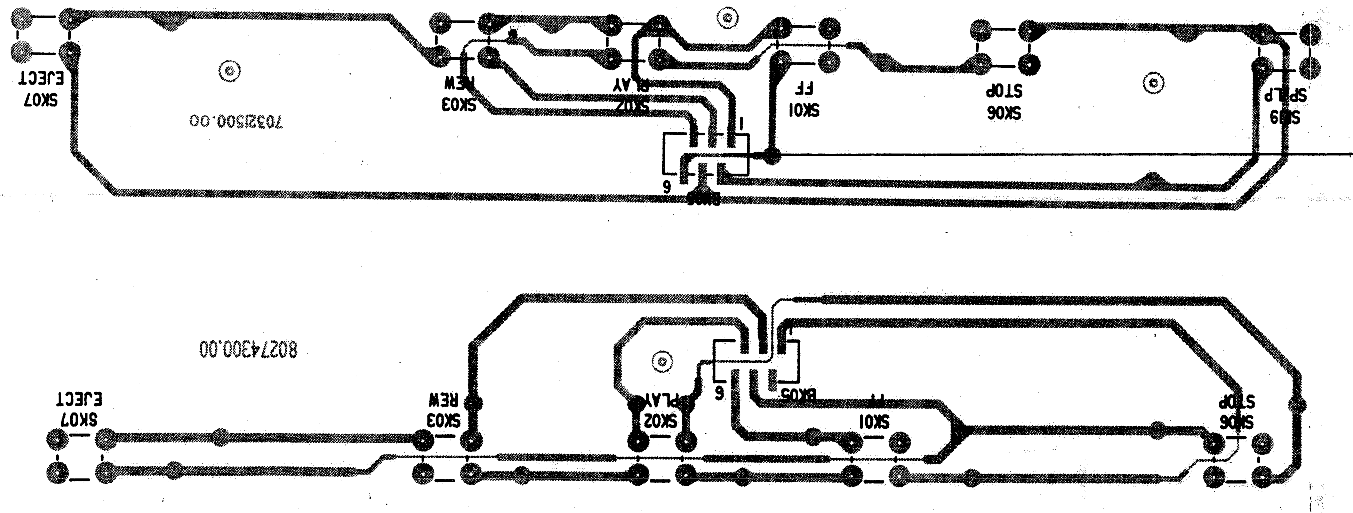
0575 Key Board PC Board (Top Side)

(V-110F only)


SK07
EJECT
SK03
REW
SK02
PLAY
6
BK05
SK01
FF
SK06
STOP
6
BK05
1
SK07
EJECT
SK03
REW
SK02
PLAY
SK01
FF
SK06
STOP
SK09
SP.LP

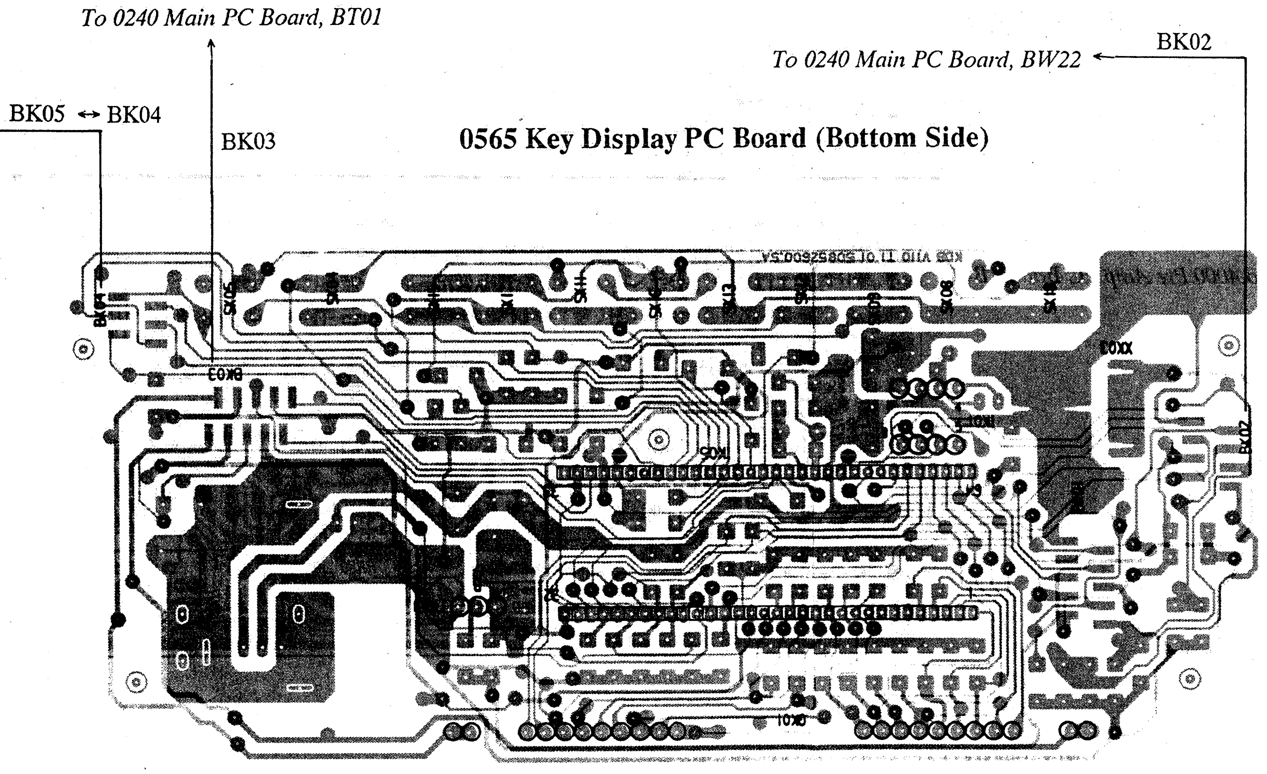

IR01
IK01
IK05
BK03
BK04
BK02
TK03
SK05
SK04
SK16
SK17
SK10
SK15
SK11
SK12
SK09
SK08
SK18
BK05 ↔ BK04
BK03
To 0240 Main PC Board, BT01
BK02
To 0240 Main PC Board, BW22

0565 Key Display PC Board (Top Side)


SK07
EJECT
SK03
REW
SK02
PLAY
SK01
FF
SK06
STOP
SK09
SP.LP
6
BK05
1
SK07
EJECT
SK03
REW
SK02
PLAY
6
BK05
SK01
FF
SK06
STOP

(V-110F only)

0575 Key Board PC Board (Bottom Side)


To 0240 Main PC Board, BT01
BK05 ↔ BK04
BK03
BK02
To 0240 Main PC Board, BW22
BK04
BK03
BK02

0565 Key Display PC Board (Bottom Side)

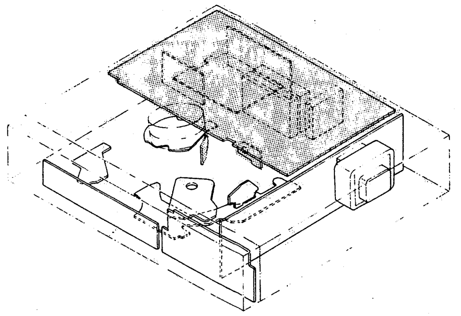
Location of ICs

Symbol No.	Location
IK01	C-10
IK05	C-9
IR01	D-7

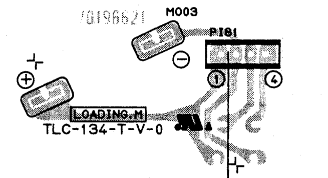
Voltage and Location of Transistor

Symbol No.	Voltage (Unit:V) E	C	B	Location
TK03	5.0	5.0		C-8

9-3-(1). Main (PIF, Video, Audio) PC Board (V-110F, V-120F, V-130F)



1500 Loading Motor PC Board


0196621
M003
PI81
LOADING.M
TLC-134-T-V-0

PI81
↕
BT03

0240 Main PC Board (Top Side)

To Full Width Erase Head
BS02

BW22
1
I
8
To 0565 Key Display PC Board, BK02 ←

BT04
To Mecha Base Main PC Board, PI51 ← 1 – 18

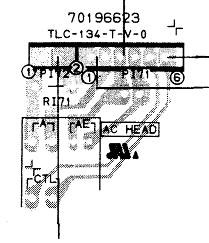
To ACE Head Relay PC Board, PI71
BT06

PI71 ↔ BS03

To 0240 Main PC Board, BT06

3 | 4

5 | 6
PI71

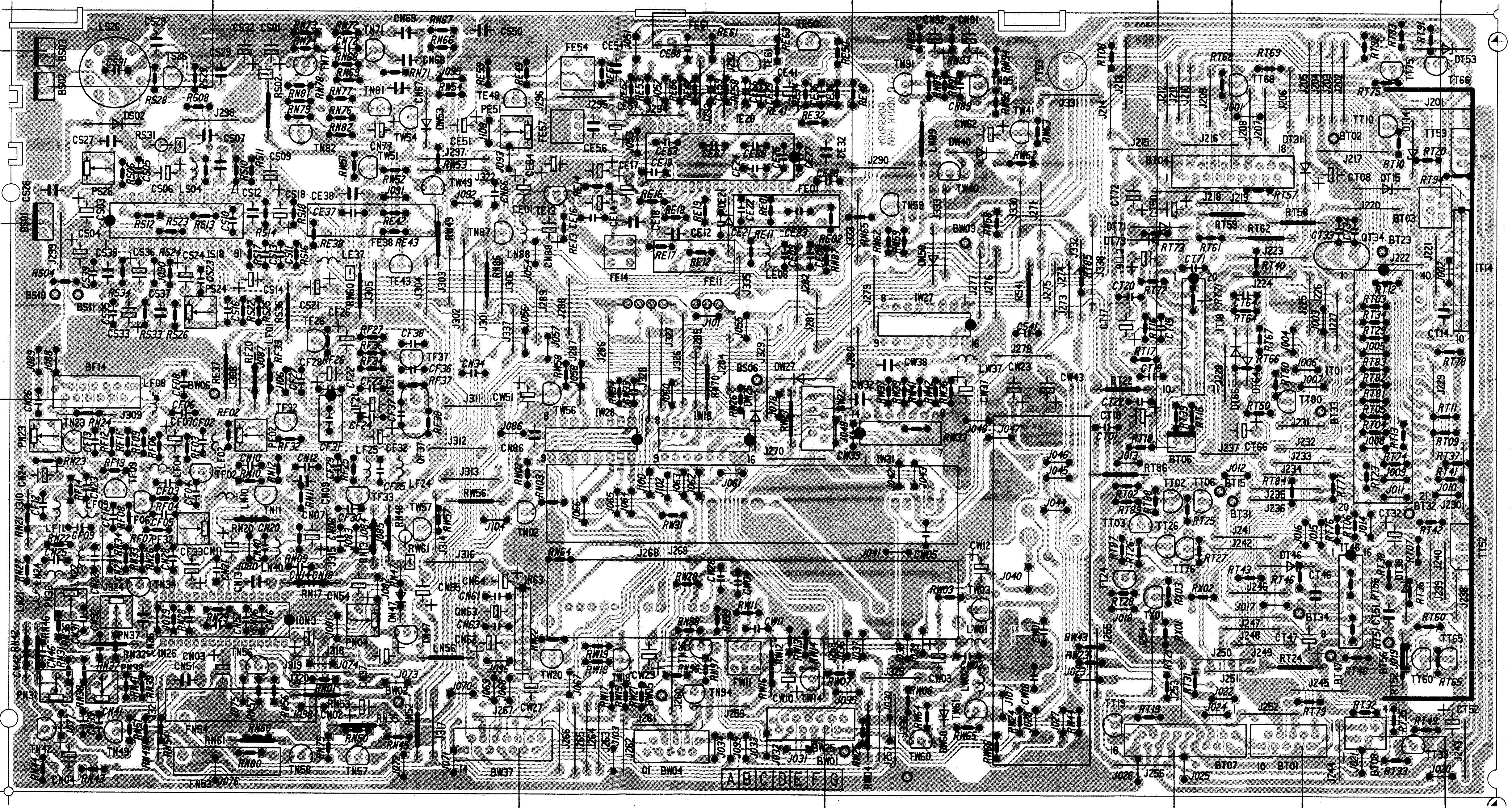

70196623
TLC-134-T-V-0
PI72
PI71
R171
AC HEAD
CTL

1 | 2
PI71 ↔ BS01

PI72
1 | 2 → *Test Connector*

ACE Head Relay P C Board

BF14
1 – 12
↓
To 4000 Pre Amp PC Board, BB01



BW37
14 – 1 → *To 0180 Terminal PC Board, BB12*

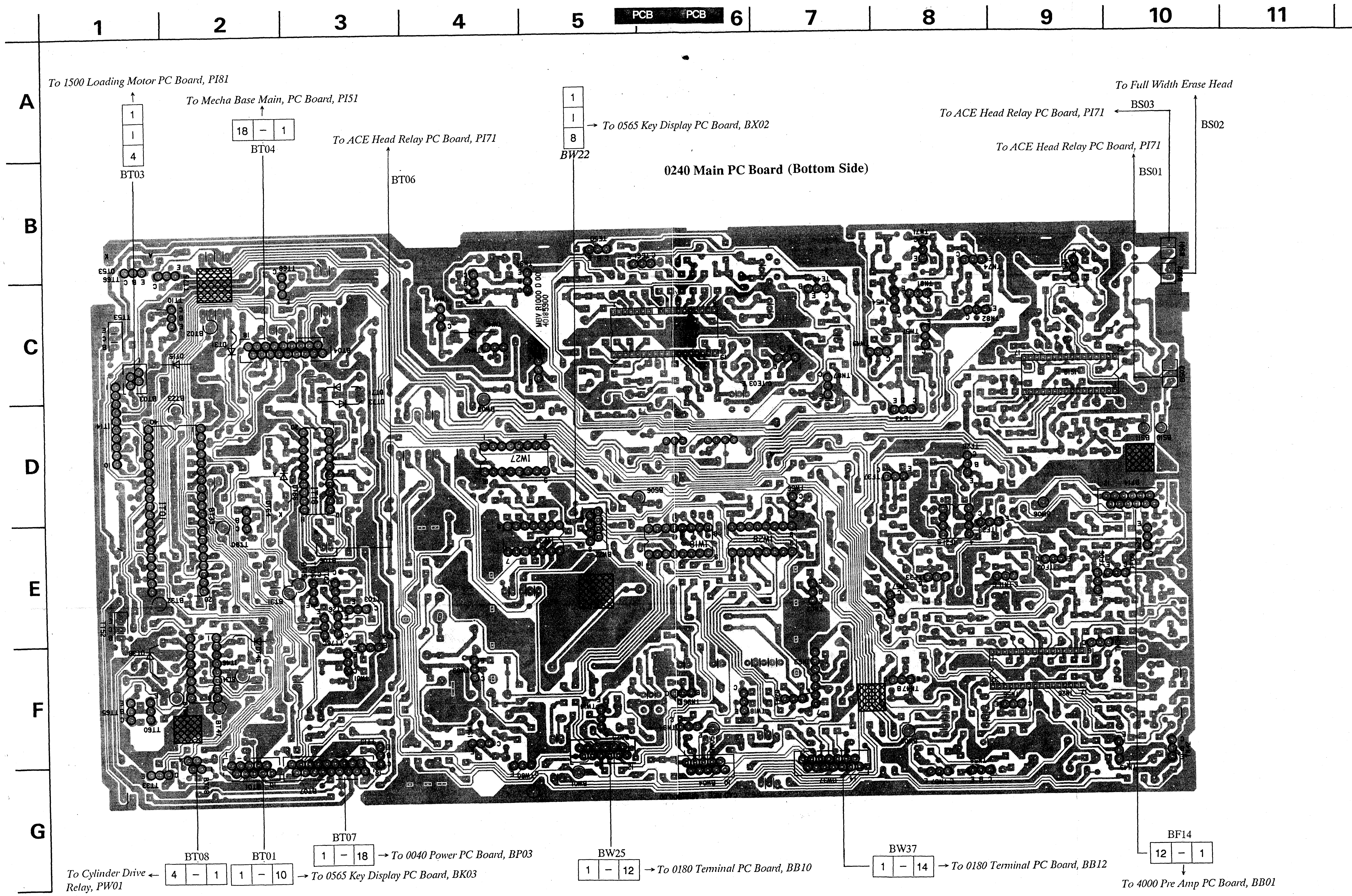
BW25
12 – 1 → *To 0180 Terminal PC Board, BB10*

BT07
18 – 1
↓
To 0040 Power PC Board, BP03

BT01
10 – 1
↓
To 0565 Key Display PC Board, BK03

BT08
1 – 4
↓
To Cylinder Drive Relay, PW01

0240 Main PC Board (Bottom Side)


PCB
PCB
1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
To 1500 Loading Motor PC Board, PI81
1
|
4
BT03
To Mecha Base Main, PC Board, PI51
18 – 1
BT04
To ACE Head Relay PC Board, PI71
BT06
1
|
8
BW22
→ To 0565 Key Display PC Board, BX02
To Full Width Erase Head
To ACE Head Relay PC Board, PI71
BS03
BS02
To ACE Head Relay PC Board, PI71
BS01
IW27
BT08
BT01
BT07
1 – 18
→ To 0040 Power PC Board, BP03
To Cylinder Drive Relay, PW01
4 – 1
1 – 10
→ To 0565 Key Display PC Board, BK03
BW25
1 – 12
→ To 0180 Terminal PC Board, BB10
BW37
1 – 14
→ To 0180 Terminal PC Board, BB12
BF14
12 – 1
To 4000 Pre Amp PC Board, BB01

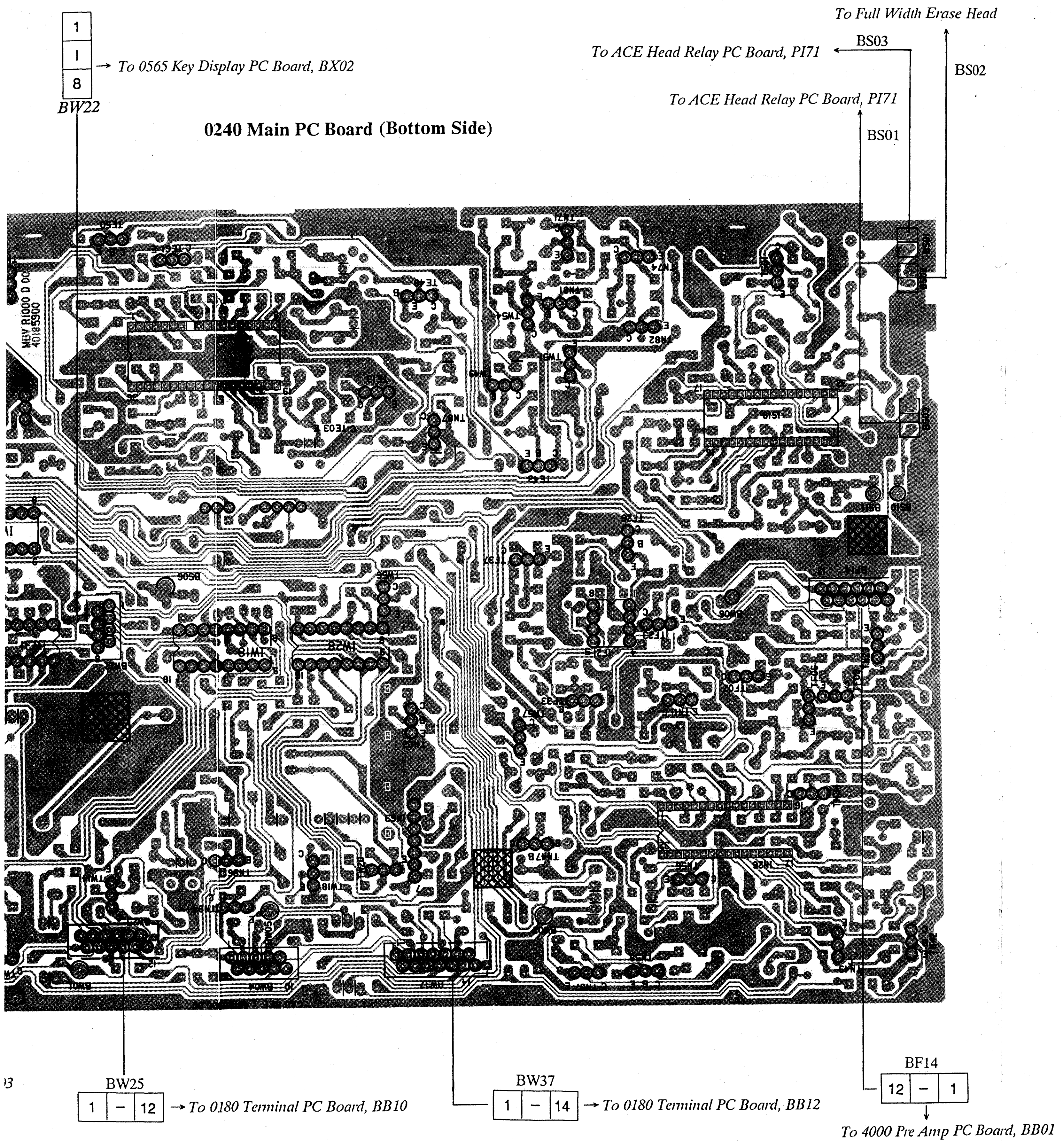
Voltage and Loc

Symbol No.	
TE13	0(0)
TE43	1.6(
TE48	1.1(
TE50	0(0)
TE61	1.6(
TF02	0(1.
TF06	0(1.
TF09	1.6(
TF26	0.8(
TF32	0(2.
TF33	0(1.
TF37	0(3.
TN02	0(0)
TN11	1.6(
TN23	2.5(
TN34	0(0)
TN42	0(0)
TN47	5.0(
TN49	2.2(
TN56	1.6(
TN57	1.5(
TN58	4.2(
TN59	0(0)
TN71	5.0(
TN74	0.1(
TN81	5.0(
TN82	0(0)
TN87	0.3(
TN91	2.5(
TN95	1.0(

Location of Di

Symbol No.	Location
DE21	
DN47	F-8
DN58	D-4
DS02	C-9
DT14	C-1
DT15	C-1
DT31	C-2
DT38	F-1
DT46	E-2
DT53	C-1
DT64	D-2
DT66	E-2
DT71	D-3
DT73	D-3
DW26	E-5
DW27	D-5
DW53	C-7

0240 Main PC Board (Bottom Side)


To Full Width Erase Head
BS03
To ACE Head Relay PC Board, PI71
BS02
1
|
8
→ To 0565 Key Display PC Board, BX02
BW22
To ACE Head Relay PC Board, PI71
BS01
3
BW25
1 – 12
→ To 0180 Terminal PC Board, BB10
BW37
1 – 14
→ To 0180 Terminal PC Board, BB12
BF14
12 – 1
To 4000 Pre Amp PC Board, BB01

Voltage and Location of Transistors

V: REC (V): PLAY

Symbol No.	Voltage (Unit:V)			Location
	E	C	B	
TE13	0(0)	0(0)	0(0.7)	C-7
TE43	1.6(2.9)	0(5.0)	0(3.6)	D-8
TE48	1.1(3.3)	5.0(5.0)	1.8(4.6)	C-7
TE50	0(0)	2.8(1.8)		B-5
TE61	1.6(2.9)	5.0(5.0)	2.3(2.3)	C-5
TF02	0(1.1)	1.6(11.1)	0(1.8)	E-9
TF06	0(1.8)	1.6(10.0)	0(2.4)	E-9
TF09	1.6(10.5)	0(2.4)	1.3(9.8)	E-9
TF26	0.8(8.8)	1.6(11.8)	1.3(9.4)	D-8
TF32	0(2.6)	0.8(0.8)	0(3.2)	E-8
TF33	0(1.8)	0.8(8.8)	0(2.4)	E-8
TF37	0(3.5)	0.6(5.1)	0.6(3.6)	D-7
TN02	0(0)	0.1(0.1)	0(0)	E-7
TN11	1.6(2.1)	1.6(7.4)	2.3(2.8)	E-8
TN23	2.5(0)	12.0(0)	3.1(0)	E-10
TN34	0(0)	0(0.4)	0.7(0)	F-9
TN42	0(0)	0.3(0)	0.2(0.7)	G-10
TN47	5.0(5.0)	5.0(3.0)	4.3(6.4)	F-7
TN49	2.2(2.4)	0(0)	1.6(1.7)	G-9
TN56	1.6(2.0)	5.0(5.0)	2.2(2.6)	F-8
TN57	1.5(1.7)	3.6(3.4)	2.2(2.3)	G-8
TN58	4.2(4.1)	2.5(2.8)	3.6(3.4)	G-8
TN59	0(0)			C-4
TN71	5.0(5.0)	3.8(3.8)	4.3(4.3)	B-8
TN74	0.1(0.1)	4.0(4.0)	0.1(0.1)	B-8
TN81	5.0(5.0)	4.9(4.9)	4.3(4.3)	C-8
TN82	0(0)	0.1(0.1)	0.7(0.7)	C-8
TN87	0.3(0.3)	0.5(0.5)	0.4(0.4)	D-7
TN91	2.5(2.5)	5.0(5.0)	3.1(3.1)	C-4
TN95	1.0(1.0)	3.1(3.1)	1.6(1.6)	C-4

Voltage and Location of Transistors

V: REC (V): PLAY

Symbol No.	Voltage (Unit:V)			Location
	E	C	B	
TT02	0.44(0.44)	4.59(4.60)	0.24(0)	E-3
TT03	0.44(0.44)	0.58(0.57)	1.08(1.09)	E-3
TT06	0.01(0)	0.23(0)	0.1(0.63)	E-2
TT10	0.01(0)	0.05(0.04)	0.06(0.0)	
TT19	0.01(0)	1.35(1.36)	0.09(0.08)	F-3
TT24	4.95(4.95)	0.01(0)	4.94(4.94)	F-3
TT26	0.01(0)	4.94(4.94)	0.01(0)	E-3
TT33	4.95(4.95)	0.65(0.73)	4.91(4.91)	G-3
TT52	7.44(7.39)	4.95(4.95)	5.56(5.57)	E-1
TT53	7.43(7.38)	5.42(5.41)	6.78(6.72)	C-1
TT66	1.84(1.82)	6.76(6.69)	2.40(2.39)	C-1
TT68	4.95(4.94)	4.83(4.83)	4.21(4.21)	C-2
TT75	0.88(0.88)	0.01(0)	0.19(0.19)	C-1
TT76	4.94(4.94)	0(0)	4.94(4.93)	F-3
TT80	4.95(4.95)	2.5(2.5)	4.9(4.9)	E-2
TS26				C-9
TW03	1.8(1.8)	0(0)	1.2(1.2)	F-4
TW14	1.6(1.6)	0	0.9(0.9)	F-5
TW18	3.6(4.7)	6.8(12.0)	4.2(4.2)	F-6
TW20	12.0(12.0)	12.0:OPEN (12.0:OPEN)	11.3(12.0)	F-7
TW49	0(0)	12.0(0.1)	0(4.7)	C-7
TW51	12.0(12.0)	1.6(12.0)	12.0(11.3)	C-8
TW54	5.0(5.0)	0(5.0)	5.0(4.3)	C-7
TW56	0(0)	0.1(12.0)	0.7(0)	E-7
TW57	12.0(12.0)	12.0(0)	11.3(12.6)	E-7
TX01	0.01(0)	0.04(0.04)	0.65(0.66)	F-3

Location of Diodes

Symbol No.	Location
DE21	
DN47	F-8
DN58	D-4
DS02	C-9
DT14	C-1
DT15	C-1
DT31	C-2
DT38	F-1
DT46	E-2
DT53	C-1
DT64	D-2
DT66	E-2
DT71	D-3
DT73	D-3
DW26	E-5
DW27	D-5
DW53	C-7

Location of ICs

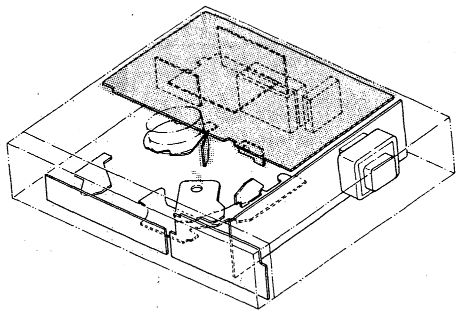
Symbol No.	Location
IE20	C-5
IF21	E-8
IN26	F-9
IN63	F-7
IS18	D-9
IT01	D-2
IT14	D-1
IT18	D-2
IT46	E-2
IW18	E-6
IW27	D-4
IW28	E-6

Location of Adjusting VRs

Symbol No.	Location
PE51	C-7
PF02	C-8
PN04	F-8
PN23	E-10
PN31	F-10
PN36	F-10
PN37	F-9
PN38	F-9

16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5

9-3-(2). Main (PIF, Video, Audio) PC Board (V-170F, V-180F)



Voltage and Location of Transistors

V: REC (V): PLAY

Symbol No.	Voltage (Unit:V)			Location
	E	C	B	
TE13	0(0)	0(0)	0(0.7)	C-7
TE43	1.6(2.9)	0(5.0)	0(3.6)	D-7
TE48	1.1(3.3)	5.0(5.0)	1.8(4.6)	C-7
TE50	0(0)	2.8(1.8)		B-5
TE61	1.6(2.9)	5.0(5.0)	2.3(2.3)	C-5
TF02	0(1.1)	1.6(11.1)	0(1.8)	E-9
TF06	0(1.8)	1.6(10.0)	0(2.4)	E-9
TF09	1.6(10.5)	0(2.4)	1.3(9.8)	E-9
TF26	0.8(8.8)	1.6(11.8)	1.3(9.4)	D-8
TF32	0(2.6)	0.8(8.8)	0(3.2)	E-8
TF33	0(1.8)	0.8(8.8)	0(2.4)	E-8
TF37	0(3.5)	0.6(5.1)	0.6(3.6)	D-7
TF44	0(2.0)	7.0(12.0)	0(2.7)	C-4
TF48	12.0(12.0)	0.2(0.3)	11.4(11.4)	C-3
TF53	0(0.1)	12.0	0(0.7)	
TN02	0(0)	0.1(0.1)	0(0)	D-6
TN11	1.6(2.1)	1.6(7.9)	2.3(2.8)	E-9
TN23	2.5(0)	12.0(0)	3.1(0)	E-10
TN34	0(0)	0(0.4)	0.7(0)	F-9
TN42	0(0)	0.3(0)	0.2(0.7)	F-10
TN47	5.0(5.0)	5.0(3.0)	4.3(6.4)	F-7
TN49	P:1.4,S:1.2	5.0(5.0)	P:2.0,S:1.8	G-9
TN56	1.6(2.0)	5.0(5.0)	2.2(2.6)	F-9
TN59				C-4
TN60	P:1.9,S:1.8	P:2.0,S:1.8	P:5.0,S:1.3	G-8
TN63			P:1.4,S:4.6	G-9
TN71	5.0(5.0)	3.8(3.8)	4.3(4.3)	B-8
TN74	0.1(0.1)	4.0(4.0)	0.1(0.1)	B-8
TN75	11.0(11.0)	3.0(3.0)	10.3(10.3)	G-7
TN80	2.0(2.0)	10.3(10.3)	2.7(2.7)	G-8
TN81	5.0(5.0)	4.9(4.9)	4.3(4.3)	C-8

Voltage and Location of Transistors

V: REC (V): PLAY

Symbol No.	Voltage (Unit:V)			Location
	E	C	B	
TN82	0(0)	0.1(0.1)	0.7(0.7)	C-8
TN85	0(0)	P:5.0,S:0	P:0,S:0.7	G-7
TN87	0.3(0.3)	0.5(0.5)	0.4(0.4)	D-7
TN91	2.5(2.5)	5.0(5.0)	3.1(3.1)	C-4
TN95	1.0(1.0)	3.1(3.1)	1.6(1.6)	C-4
TT01	0(0)	0.2(0)	0.2(0.7)	B-2
TT02	0.4(0.4)	4.6(4.6)	0.2(0)	B-1
TT06	0.01(0)	0.3(0.2)	0(0)	D-2
TT20	0.4(0.4)	0.6(0.6)	1.1(1.1)	C-1
TT36	0(0)	4.9(4.9)	0(0)	F-3
TT37	4.9(4.9)	0(0)	4.9(4.9)	F-3
TT43	4.9(4.9)	4.8(4.8)	4.2(4.2)	C-2
TT44	0.8(0.8)	0(0)	0(0)	C-1
TT46	0(0)	6.0(6.0)	0(0)	F-3
TT60	4.8(4.9)	0(0)	3.3(3.2)	D-3
TT64	4.9(4.9)	9.6(9.6)	5.5(5.5)	E-1
TT70	4.6(4.6)	8.4(8.3)	5.1(5.1)	C-1
TT71	9.6(9.5)	5.2(5.2)	8.4(8.3)	C-1
TT77	4.9(4.9)	0(0)	4.9(4.9)	F-2
TT78	0(0)	4.9(4.9)	4.9(4.9)	F-2
TT83	0(0)	0(0)	0.6(0.6)	F-2
TS26				C-9
TW04	0	P:10.4,S:0(0)	P:0,S:0(0.6)	E-4
TW14	3.8(3.8)	0	3.1(3.1)	F-5
TW18	3.6(4.7)	6.8(12.0)	4.2(4.2)	F-6
TW20	12.0(12.0)	12.0:OPEN (12.0:OPEN)	11.3(12.0)	F-6
TW49	0(0)	12.0(0.1)	0(4.7)	C-7
TW51	12.0(12.0)	1.6(12.0)	12.0(11.3)	C-8
TW54	5.0(5.0)	0(5.0)	5.0(4.3)	C-7
TW56	0(0)	0.1(12.0)	0.7(0)	D-6
TW57	12.0(12.0)	12.0(0)	11.3(12.0)	E-7
TX01	0.01(0)	0.04(0.04)	0.65(0.66)	

Location of Diodes

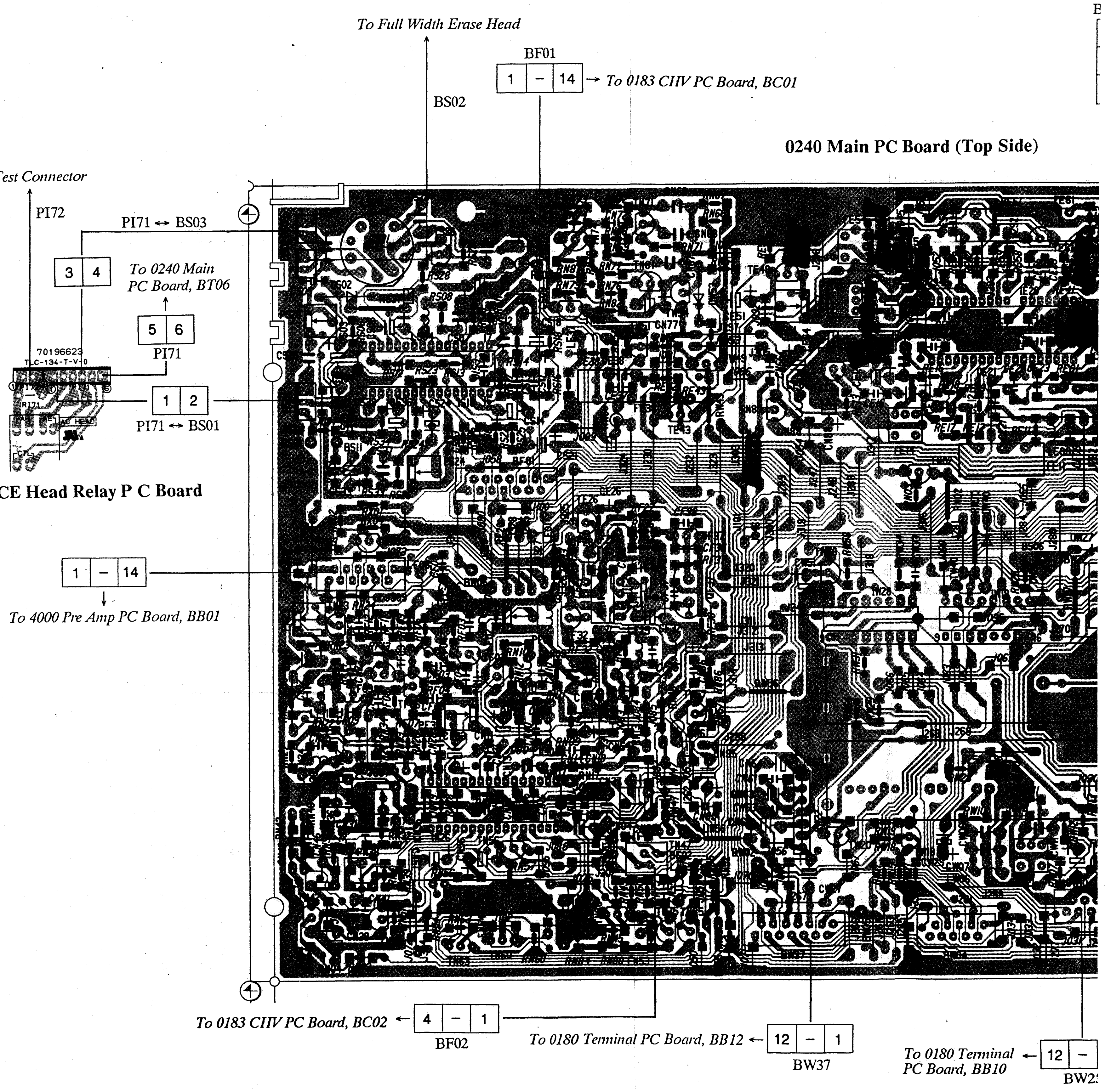
Symbol No.	Location
DE21	C-6
DF48	C-3
DN47	F-7
DN58	D-4
DS02	C-9
DT06	D-1
DT07	D-1
DT21	D-3
DT22	D-3
DT24	D-2
DT27	D-2
DT51	E-2
DT70	
DT72	E-2
DW26	E-5
DW27	D-5
DW53	C-7
DY11	

Location of ICs

Symbol No.	Location
IE20	C-5
IF21	E-8
IN26	F-9
IN63	F-7
IT01	D-2
IT06	D-1
IT10	E-2
IT50	E-2
IT80	F-1
IW18	E-5
IW27	D-4
IW28	E-6
IW31	E-4

Location of Adjusting VRs

Symbol No.	Location
PE51	C-7
PF02	E-8
PN04	F-8
PN23	E-10
PN31	F-10
PN36	F-10
PN37	F-9
PN38	F-9


To Full Width Erase Head
BF01
1 – 14
To 0183 CHV PC Board, BC01
BS02
0240 Main PC Board (Top Side)
Test Connector
PI72
PI71 ↔ BS03
3 4
To 0240 Main PC Board, BT06
5 6
PI71
70196623
TLC-134-T-V-0
1 2
PI71 ↔ BS01
ACE Head Relay P C Board
1 – 14
To 4000 Pre Amp PC Board, BB01
To 0183 CHV PC Board, BC02
4 – 1
BF02
To 0180 Terminal PC Board, BB12
12 – 1
BW37
To 0180 Terminal PC Board, BB10
12 –
BW2

12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

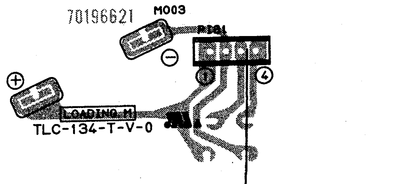
): PLAY

	Location
	C-8
	G-7
	D-7
	C-4
	C-4
	B-2
	B-1
	D-2
	C-1
	F-3
	F-3
	C-2
	C-1
	F-3
	D-3
	E-1
	C-1
	C-1
	F-2
	F-2
	F-2
	C-9
)	E-4
	F-5
	F-6
	F-6
	C-7
	C-8
	C-7
	D-6
	E-7

ion of Adjusting VRs

ool	Location
	C-7
	E-8
	F-8
	E-10
	F-10
	F-10
	F-9
	F-9

1500 Loading Motor PC Board


70196621
M003
PI81
LOADING M
TLC-134-T-V-0
⊕
⊖

PI81 ↕ BT03

To Mecha Base Main PC Board, PI51 ↑ 1 – 18 BT04

To ACE Head Relay PC Board, PI71 BT06

BW22 1 | 8 → To 0565 Key Display PC Board, BK02

To Full Width Erase Head BS02

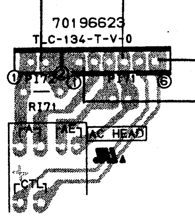
BF01 1 – 14 → To 0183 CHV PC Board, BC01

Test Connector PI72

PI71 ↔ BS03 3 4

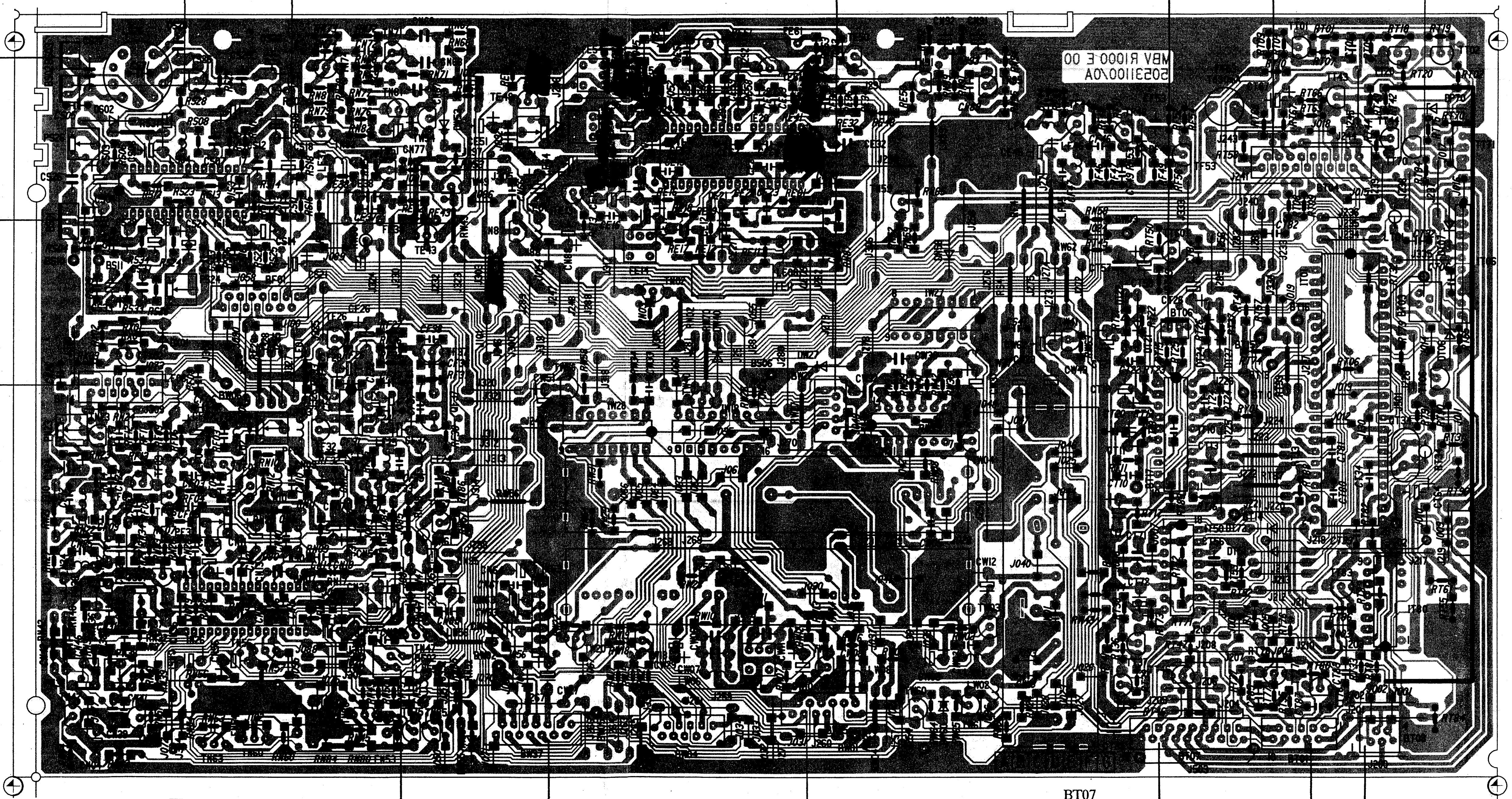
To 0240 Main PC Board, BT06 ↑ 5 6 PI71

1 2 PI71 ↔ BS01


70196623
TLC-134-T-V-0
PI72
PI71
RI71
AC HEAD
CTL

ACE Head Relay P C Board

0240 Main PC Board (Top Side)


MBV R1000 E 00
50531100/0A

1 – 14 ↓ To 4000 Pre Amp PC Board, BB01

To 0183 CHV PC Board, BC02 ← 4 – 1 BF02

To 0180 Terminal PC Board, BB12 ← 12 – 1 BW37

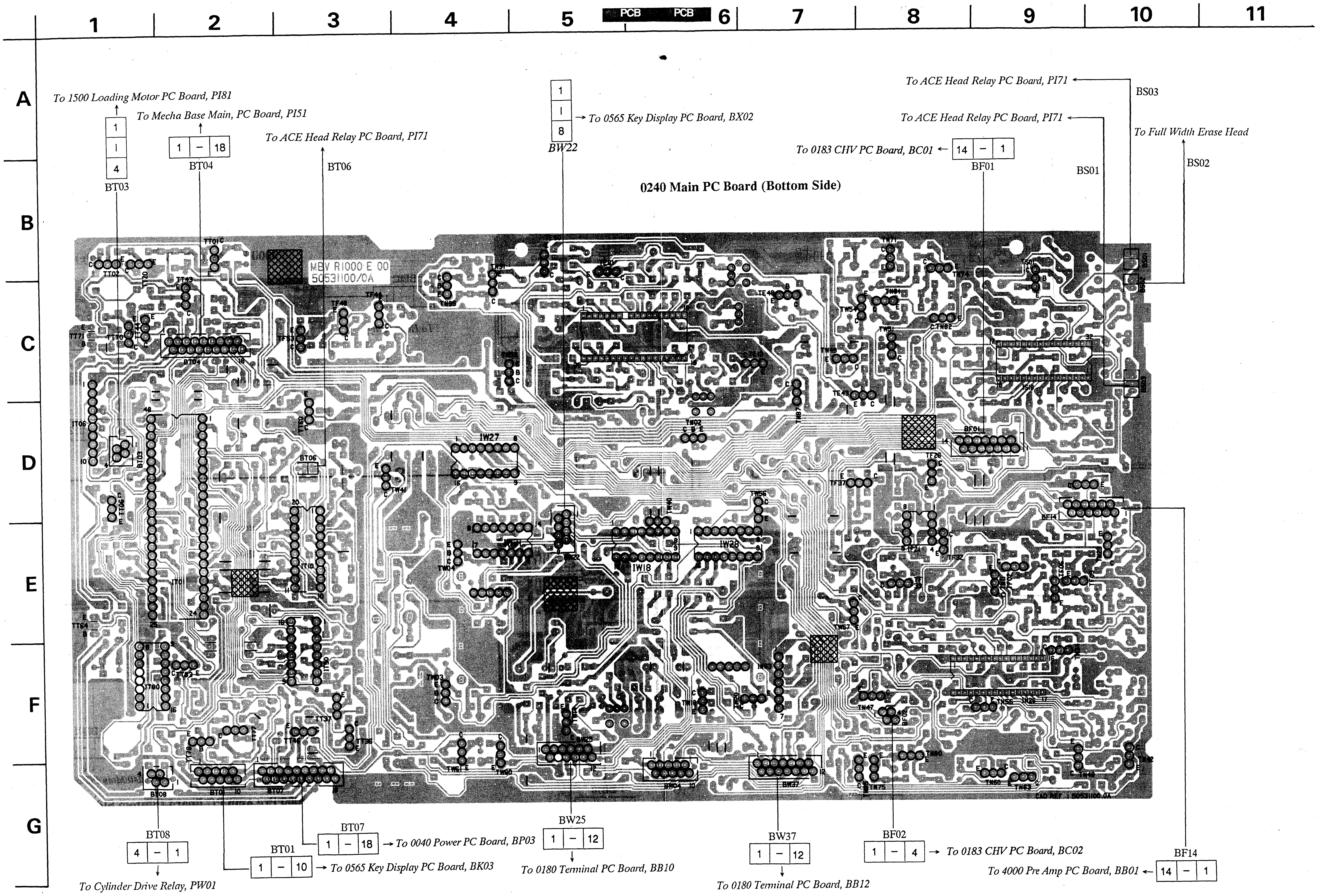
To 0180 Terminal PC Board, BB10 ← 12 – 1 BW25

BT07 To 0040 Power PC Board, BP03 ← 18 – 1

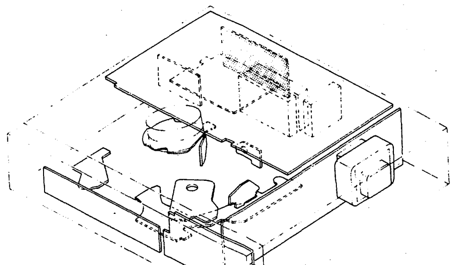
BT01 To 0565 Key Display PC Board, BK03 ← 10 – 1

BT08 1 – 4 ↓ To Cylinder Drive Relay, PW01

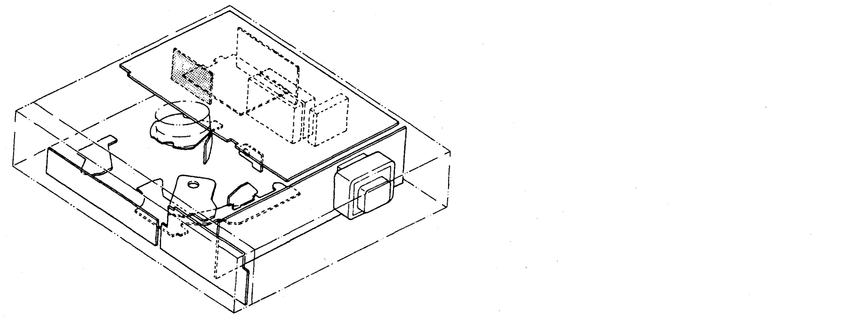
0240 Main PC Board (Bottom Side)


PCB
PCB
1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
To 1500 Loading Motor PC Board, PI81
1
|
4
BT03
To Mecha Base Main, PC Board, PI51
1 – 18
BT04
To ACE Head Relay PC Board, PI71
BT06
1
|
8
BW22
To 0565 Key Display PC Board, BX02
To ACE Head Relay PC Board, PI71
BS03
To ACE Head Relay PC Board, PI71
To Full Width Erase Head
To 0183 CHV PC Board, BC01
14 – 1
BF01
BS01
BS02
MBV R1000 E 00
50531100/0A
IW27
IW28
IW18
BT08
4 – 1
To Cylinder Drive Relay, PW01
BT01
1 – 10
To 0565 Key Display PC Board, BK03
BT07
1 – 18
To 0040 Power PC Board, BP03
BW25
1 – 12
To 0180 Terminal PC Board, BB10
BW37
1 – 12
To 0180 Terminal PC Board, BB12
BF02
1 – 4
To 0183 CHV PC Board, BC02
BF14
14 – 1
To 4000 Pre Amp PC Board, BB01

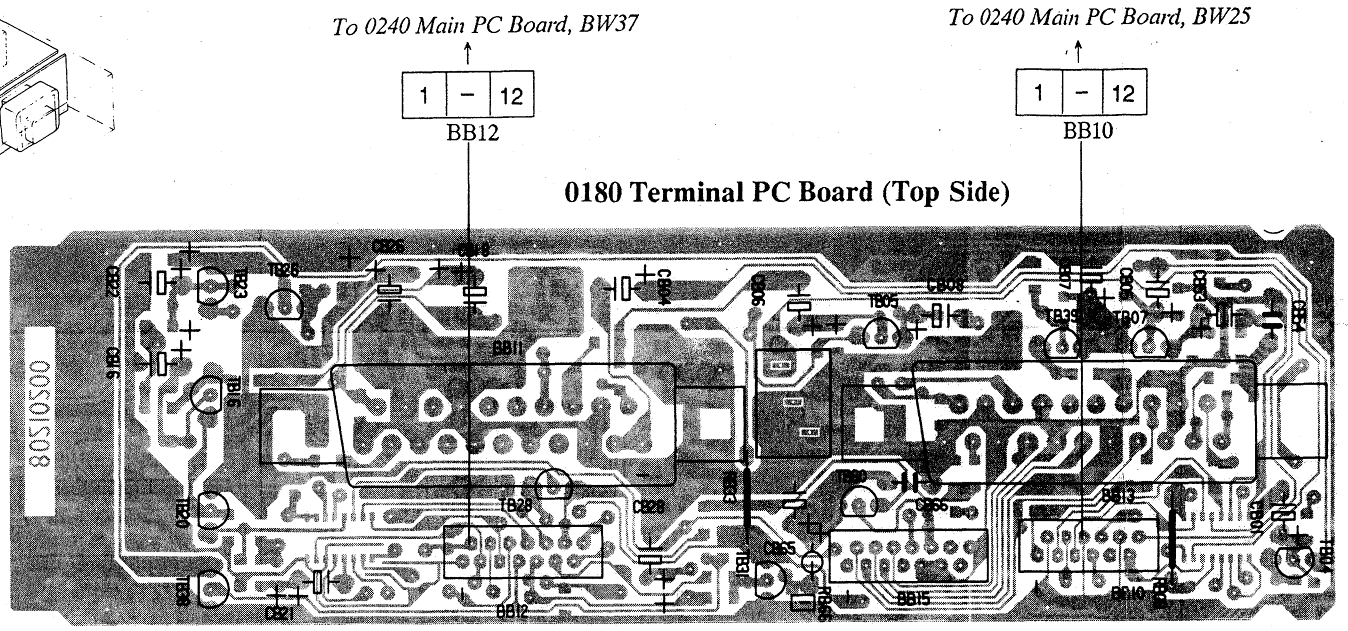
9-4. Terminal PC Board



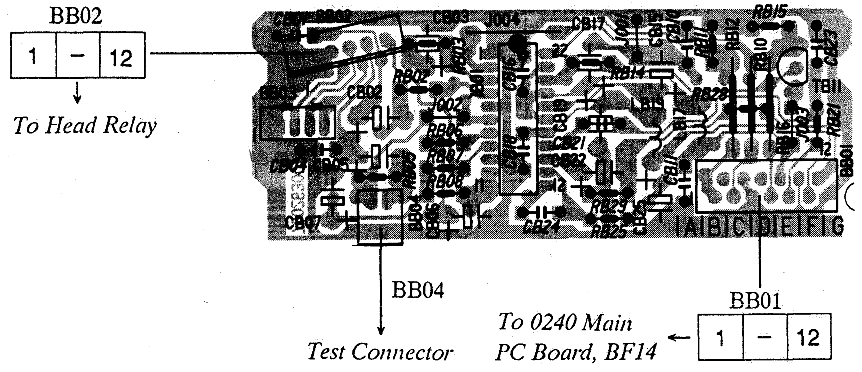
9-5. Pre Amp PC Board



0180 Terminal PC Board (Top Side)


To 0240 Main PC Board, BW37
1 – 12
BB12
To 0240 Main PC Board, BW25
1 – 12
BB10
BB11
TB28
BB15
0020108

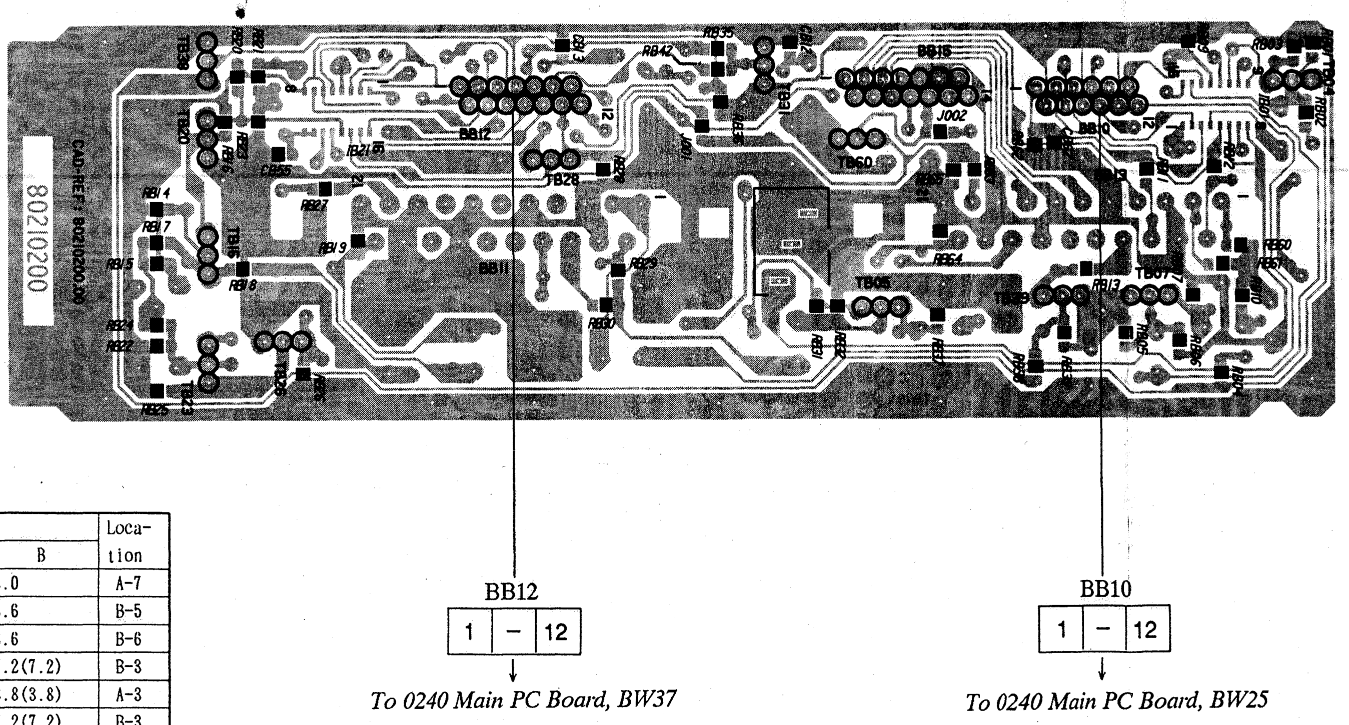
4000 Pre Amp PC Board (Top Side)

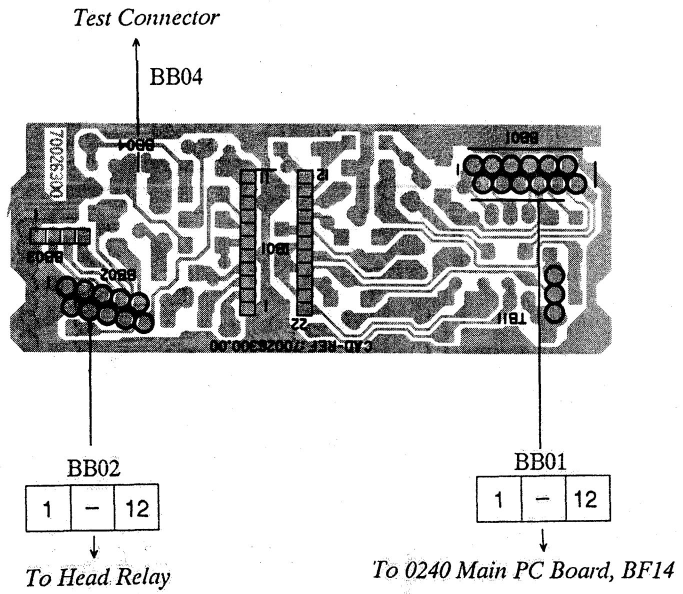

BB02
1 – 12
To Head Relay
BB04
Test Connector
BB01
To 0240 Main PC Board, BF14
1 – 12
A B C D E F G

D C B A

1 2 3 4 5 6 7 8 9 10 11

A B C D


BB12
1 – 12
To 0240 Main PC Board, BW37
BB10
1 – 12
To 0240 Main PC Board, BW25
BB11
TB28
80210200


Test Connector
BB04
BB02
1 – 12
To Head Relay
BB01
1 – 12
To 0240 Main PC Board, BF14
IB01
TB11

4000 Pre Amp PC Board (Bottom Side)

Location of ICs

Sym-bol	Loca-tion
IB01*	A-7
IB21*	B-3

* shows the parts only on the bottom side.

Voltage and Location of Transistor

Symbol No.	Voltage (Unit:V)			Loca-tion
	E	C	B	
TB04	2.3	5.4	3.0	A-7
TB05	3.0	12.3	3.6	B-5
TB07	3.0	12.3	3.6	B-6
TB16	7.9(7.9)	3.8(3.8)	7.2(7.2)	B-3
TB20	3.1(3.1)	12.0(12.0)	3.8(3.8)	A-3
TB23	7.9(7.9)	2.8(2.8)	7.2(7.2)	B-3
TB26	2.1(2.1)	12.0(12.0)	2.8(2.8)	B-3
TB28	1.7(2.0)	5.0(5.0)	2.4(2.7)	B-4
TB31	0(0)	0(0)	0(0.7)	A-5
TB38	0(0)	12.0(0)	0(0.7)	A-3
TB39	12.0(12.0)	0(12.0)	12.0(11.3)	B-6

Voltage and Location of Transistor V:REC (V):PLAY

Symbol No.	Voltage (Unit:V)			Loca-tion
	E	C	B	
TB11	0(0.9)	0(4.9)	0(1.6)	B-11

Location of IC

Symbol No.	Loca-tion
IB01	B-10

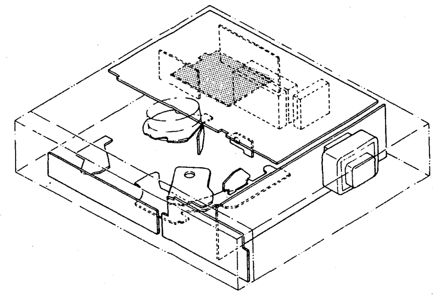
D

9-6. CHV PC Board

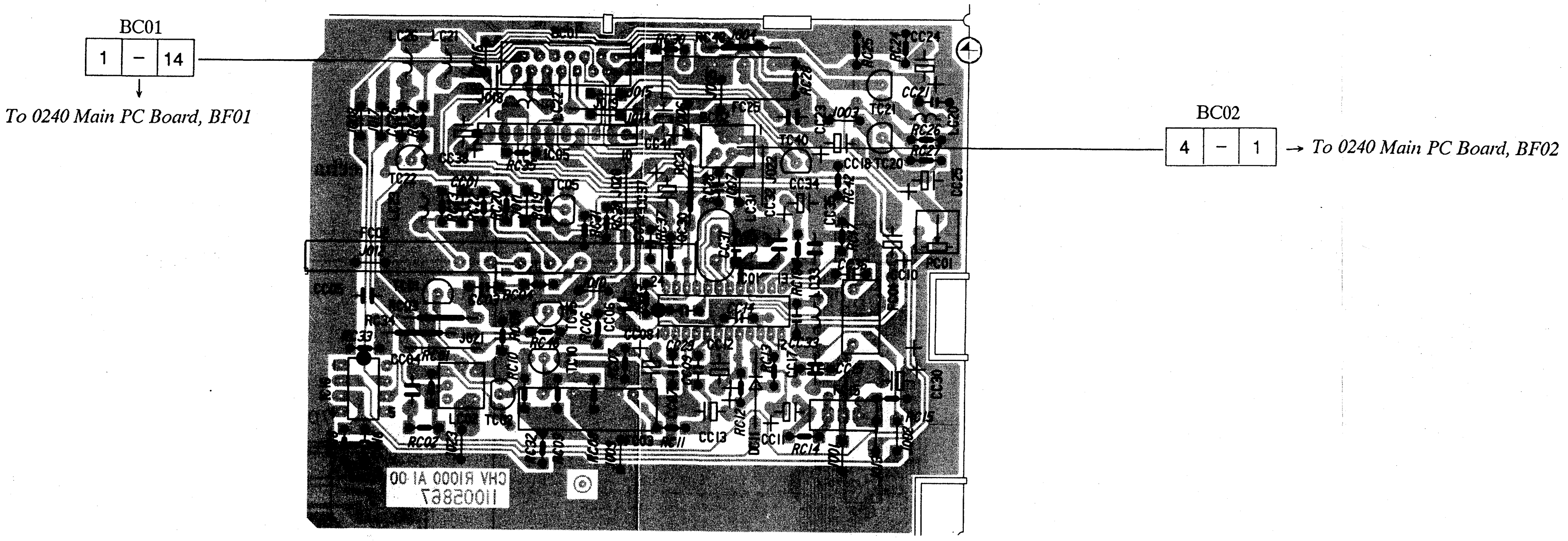
C

B

A



0183 CHV PC Borad (Top Side)


BC01
1 – 14
To 0240 Main PC Board, BF01
BC02
4 – 1
→ To 0240 Main PC Board, BF02
CHV R1000 A1 00
11005867

1 2 3 4 5 6 7 8 9 10 11

A

B

C

D

Location of ICs

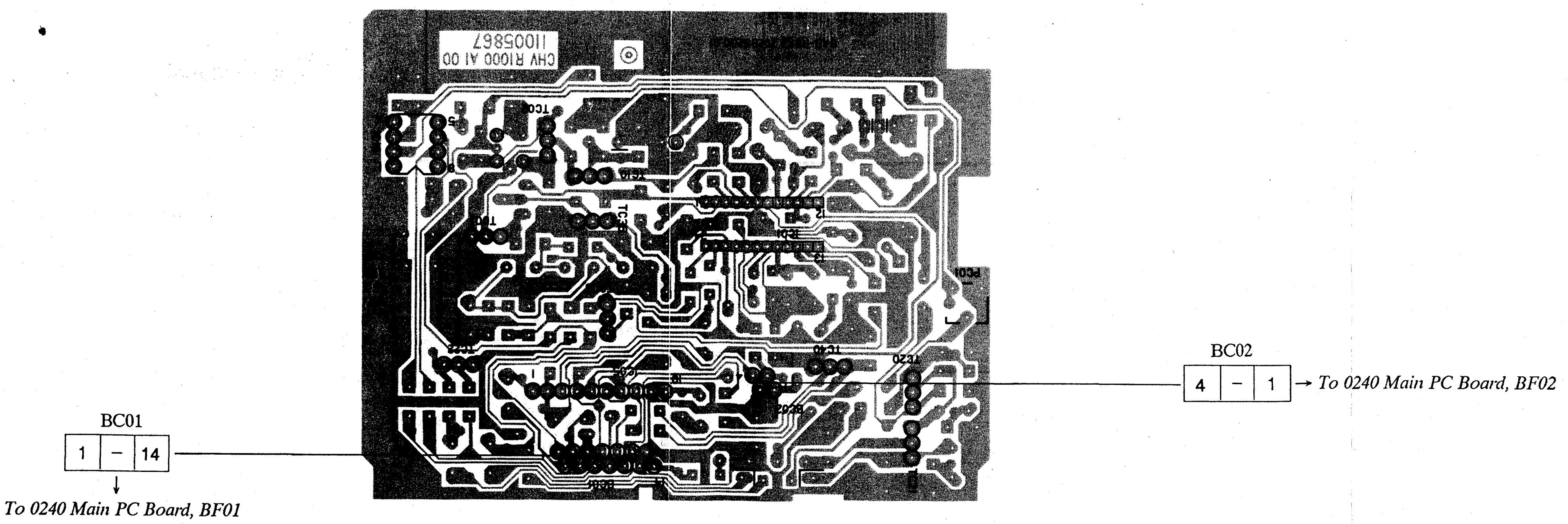
Sym-bol	Loca-tion
IC01	B-6
IC05	C-5
IC16	A-4

Location of Transistors

Sym-bol	Voltage (Unit:V)			Loca-tion
	E	C	B	
TC01	0(2.7)	0(0)	0(2.0)	B-5
TC02	0(4.1)	0(2.0)	3.4(3.)	A-5
TC05	0(0.6)	0(3.4)	0(1.3)	B-5
TC10	3.4	1.9	2.8	B-5
TC20	0(2.2)	0(5.0)	0(2.8)	C-7
TC21	0(0.7)	0(2.8)	0(1.3)	C-7
TC22	0	0	0	C-5
TC35	0	0(4.5)	0.7(0)	B-5
TC40	1.1	5.0	1.8	C-7

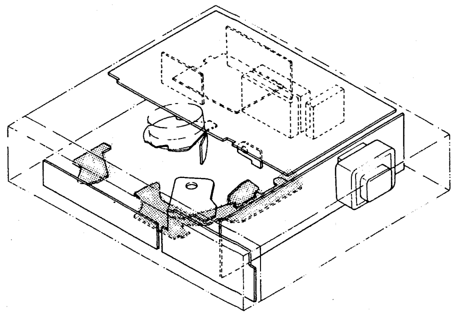
Location of Diodes

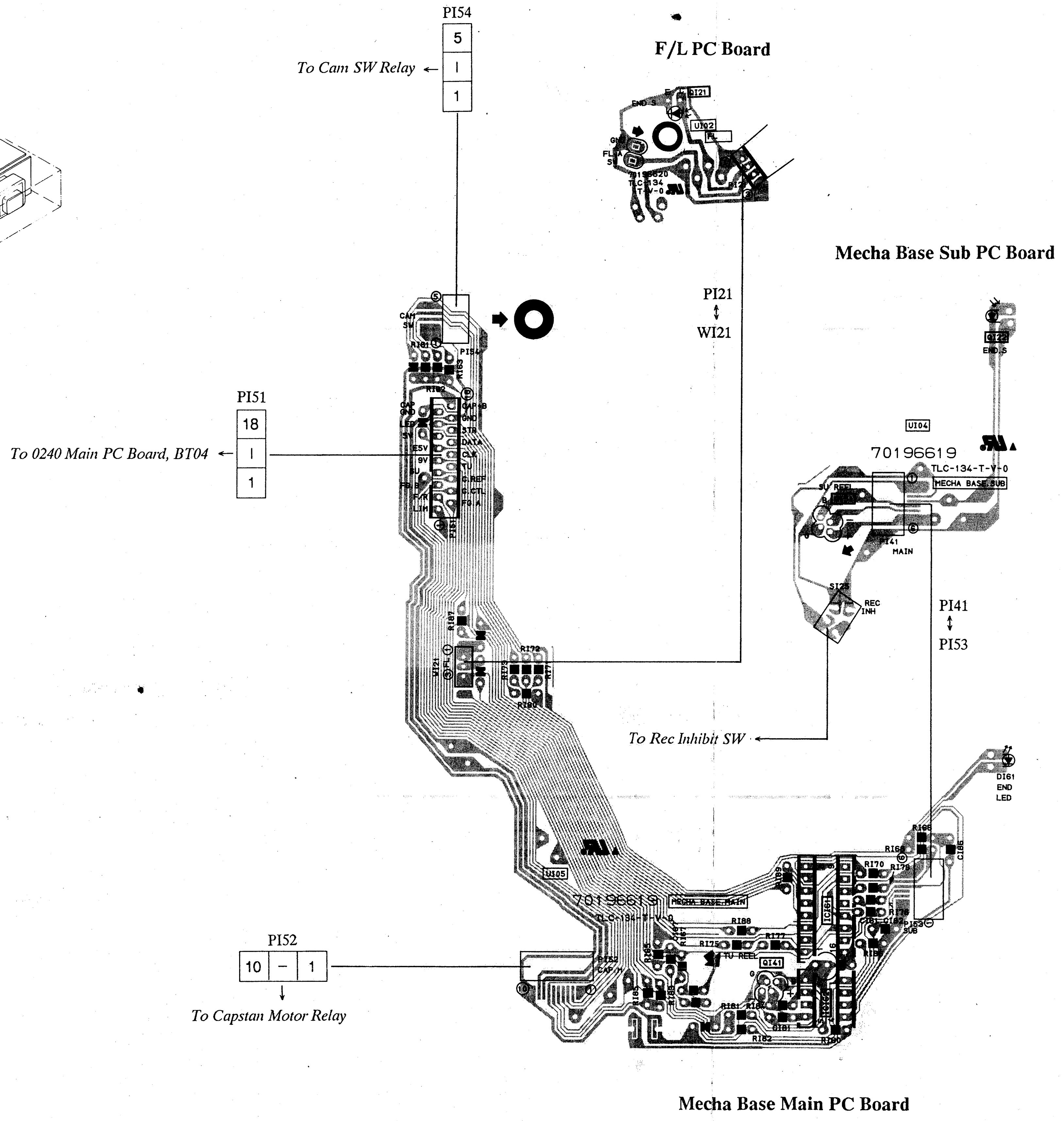
Sym-bol	Loca-tion
DC11	A-6


CHV R1000 A1 00
11005867
BC02
4 – 1
→ To 0240 Main PC Board, BF02
BC01
1 – 14
To 0240 Main PC Board, BF01

0183 CHV PC Board (Bottom Side)

9-7. Others





PI54
5
To Cam SW Relay
1
F/L PC Board
PI21
WI21
Mecha Base Sub PC Board
PI51
18
To 0240 Main PC Board, BT04
1
CAM SW
PI41
PI53
To Rec Inhibit SW
REC INH
MECHA BASE SUB
70196619
TLC-134-T-V-0
MECHA BASE MAIN
D161 END LED
PI52
10
1
To Capstan Motor Relay
Mecha Base Main PC Board

Location of Transistors

Symbol No.	Location
Q121	A-6
Q122	C-8
Q141	F-7
Q151	D-7

Location of ICs

Symbol No.	Location
IC161	F-7
IC162	F-7

Location of Diode

Symbol No.	Location
D161	E-8

SECTION 4
PARTS LIST

SAFETY PRECAUTION

The parts identified by ⚠ mark are critical for safety. Replace only with part number specified.
The mounting position of replacement is to be identical with originals. The substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

NOTICE

The part number must be used when ordering parts in order to assist in processing, be sure to include the model number and description.
Parts marked # are of chip type and mounted on original PC boards.
However, when they are placed for servicing works, use discrete parts listed on the parts list.
This parts list is based on the model V-110F. For other models, different parts only are listed on the difference list.

ABBREVIATIONS

1. **Integrated circuit (IC)**
2. **Capacitor (Cap)**
   - **Unit**

		Ex.
F	farad	
MF	microfarad ($\mu F = 10^{-6}F$)	10MF = 10μF
PF	picofarad ($pF = 10^{-6}\mu F = 10^{-12}F$)	10PF = 10pF

   - **Capacitance tolerance (for nominal capacitance higher than 10pF)**

Symbol	B	C	D	F	G	J	K	M	N
Tolerance %	±0.1	±0.25	±0.5	±1	±2	±5	±10	±20	±30

Symbol	P	Q	T	U	V	W	X	Y	Z
Tolerance %	+100 0	+30 −10	+50 −10	+75 −10	+20 −10	+100 −10	+40 −20	+150 −10	+80 −20

Ex. 10MF J = 10μF ±5%

   - **Capacitance tolerance (for nominal capacitance lower than 10pF)**

Symbol	B	C	D	F	G
Tolerance pF	±0.1	±0.25	±0.5	±1	±2

Ex. 10PF G = 10pF ± 2pF

3. **Resistor (Res)**
   - **Unit**

		Ex.	
No Mark	Ω	10	10Ω
K	kΩ	10K	10kΩ
M	MΩ	10M	10MΩ
W	Watt	1W	1 Watt

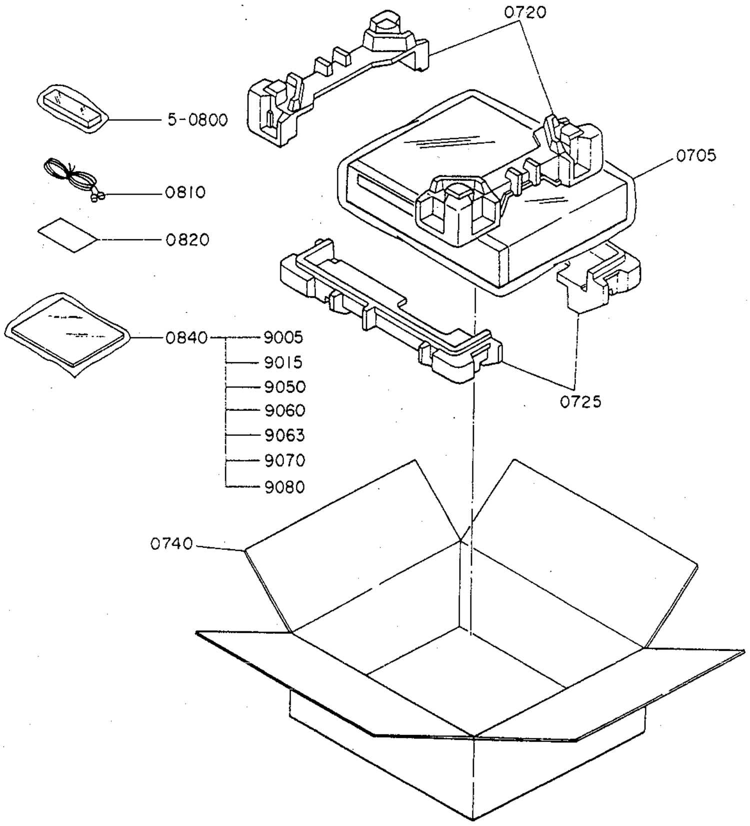
   - **Resistance tolerance**

Symbol	B	C	D	F	G	J	K	M
Tolerance %	±0.1	±0.25	±0.5	±1	±2	±5	±10	±20

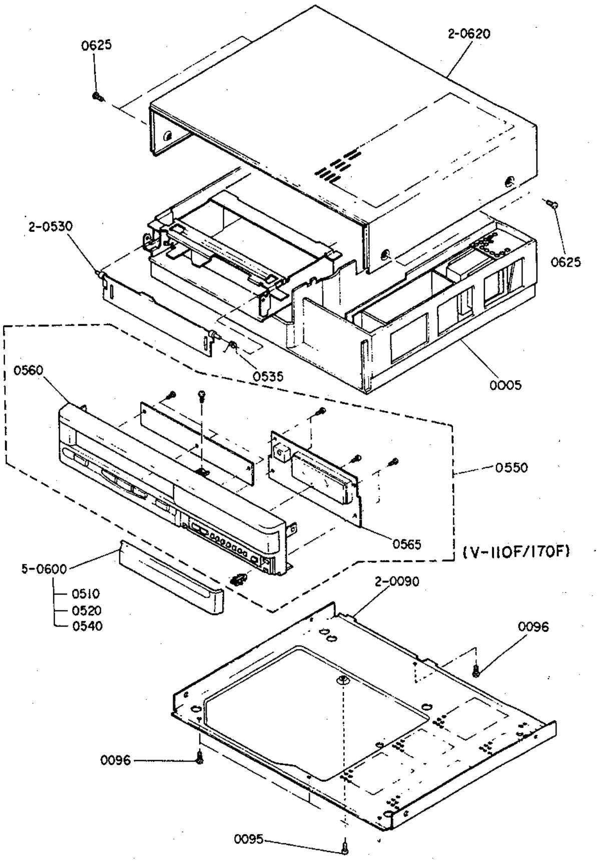
Ex. 470 J = 470Ω ± 5%

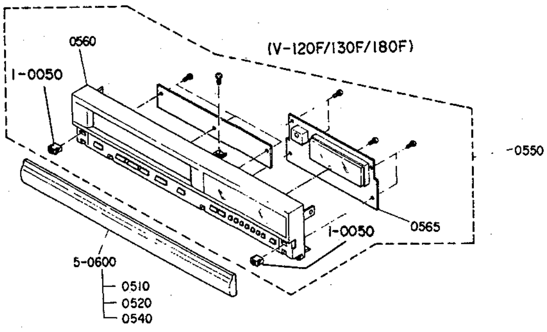
1. EXPLODED VIEWS

(1) Packing Assembly

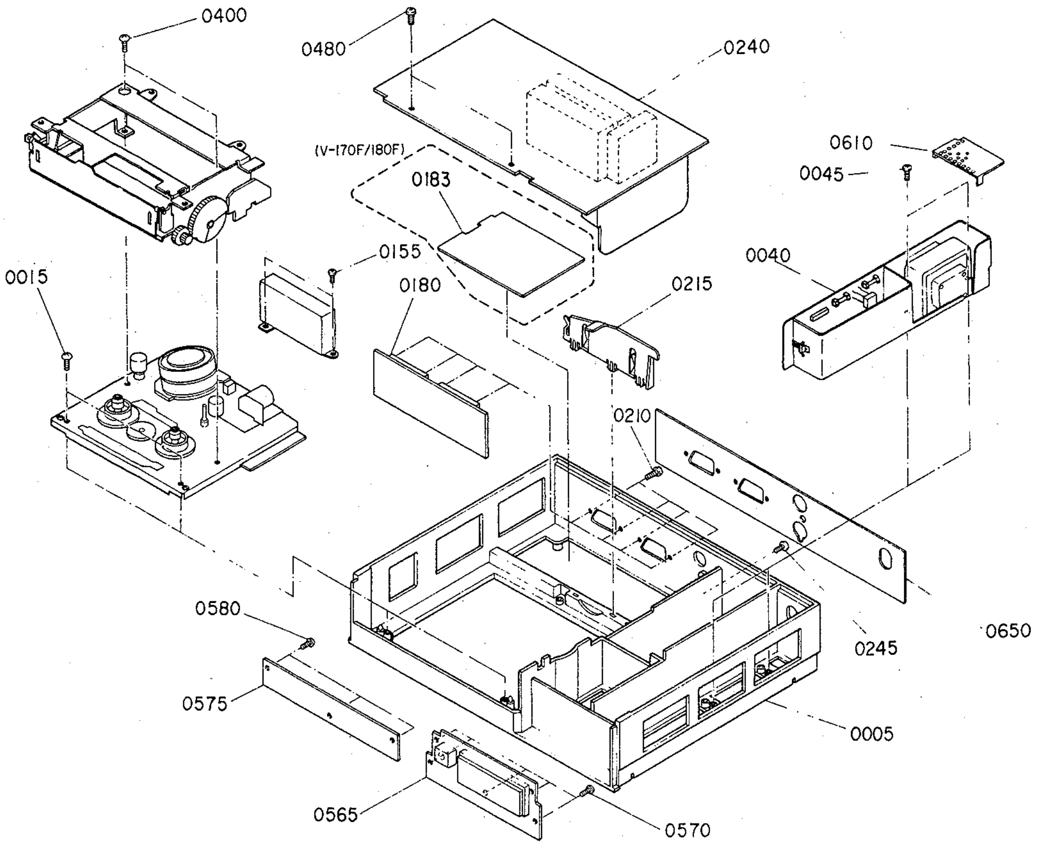

0720
5-0800
0705
0810
0820
0840
9005
9015
9050
9060
9063
9070
9080
0725
0740

(2) Cabinet Assemlby

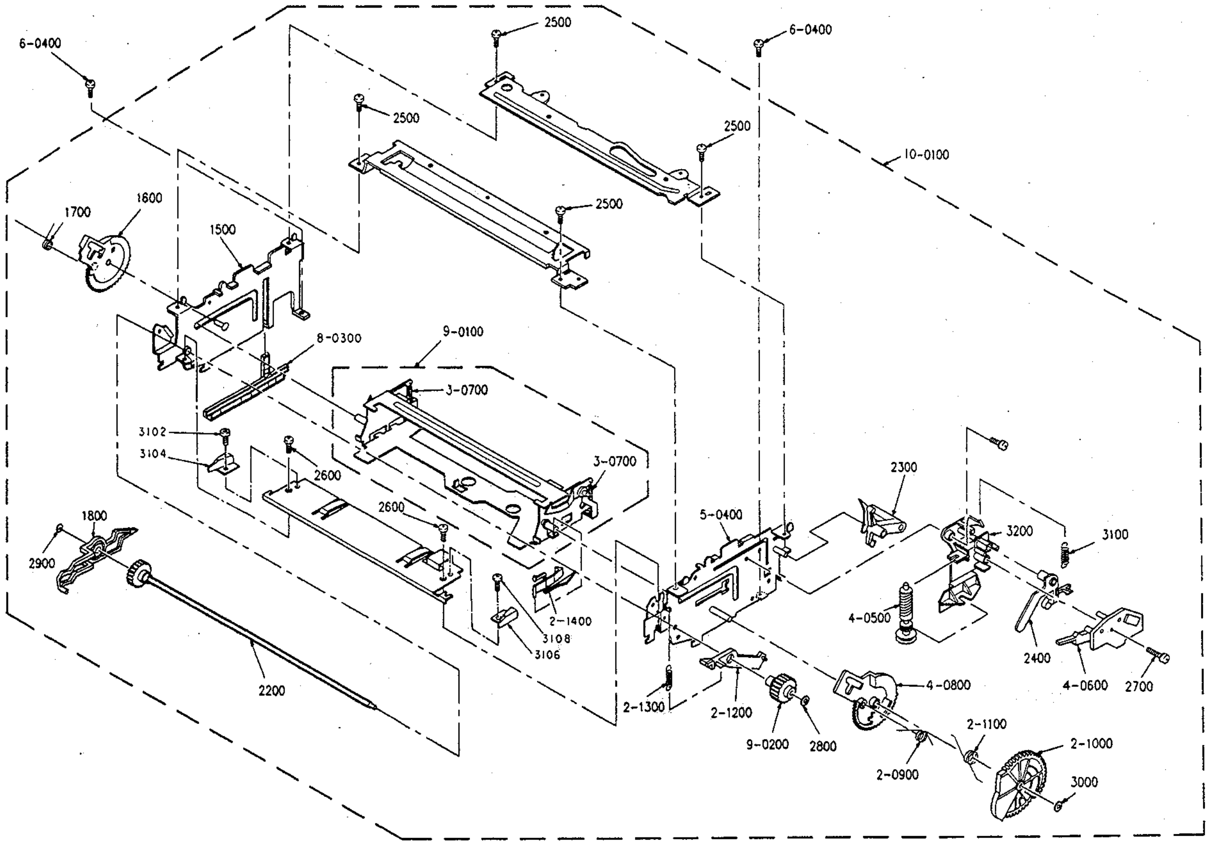

0625
2-0620
2-0530
0625
0535
0005
0560
0550
0565
(V-110F/170F)
5-0600
0510
0520
0540
2-0090
0096
0096
0095


0560
(V-120F/130F/180F)
1-0050
-0550
0565
1-0050
5-0600
0510
0520
0540

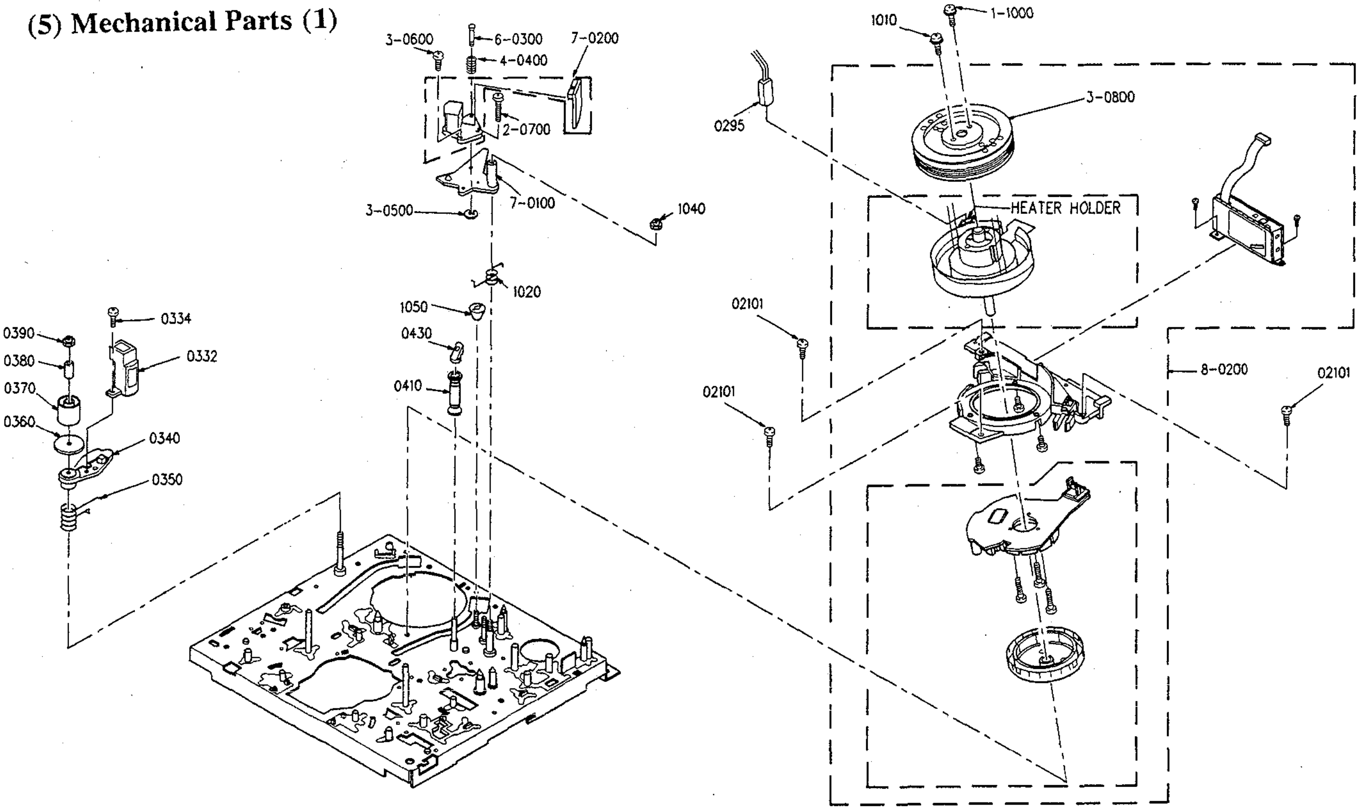
(3) Chassis Assembly


0400
0480
0240
(V-170F/180F)
0183
0610
0045
0155
0040
0015
0180
0215
0210
0580
0245
0650
0575
0005
0565
0570

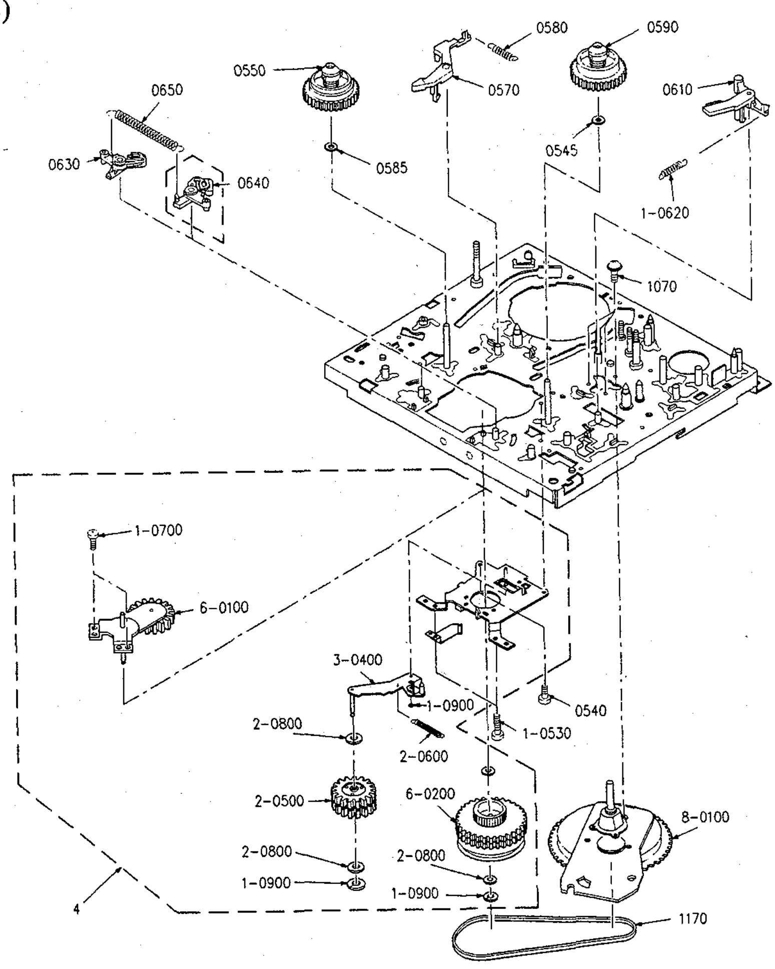
(4) Cassette Holder Assembly


6-0400
2500
6-0400
2500
2500
10-0100
1600
1700
2500
1500
9-0100
8-0300
3-0700
3102
3104
3-0700
2600
2300
1800
2600
5-0400
3200
3100
2900
4-0500
2-1400
3108
3106
2400
4-0600
2700
4-0800
2200
2-1300
2-1200
9-0200
2800
2-1100
2-1000
2-0900
3000

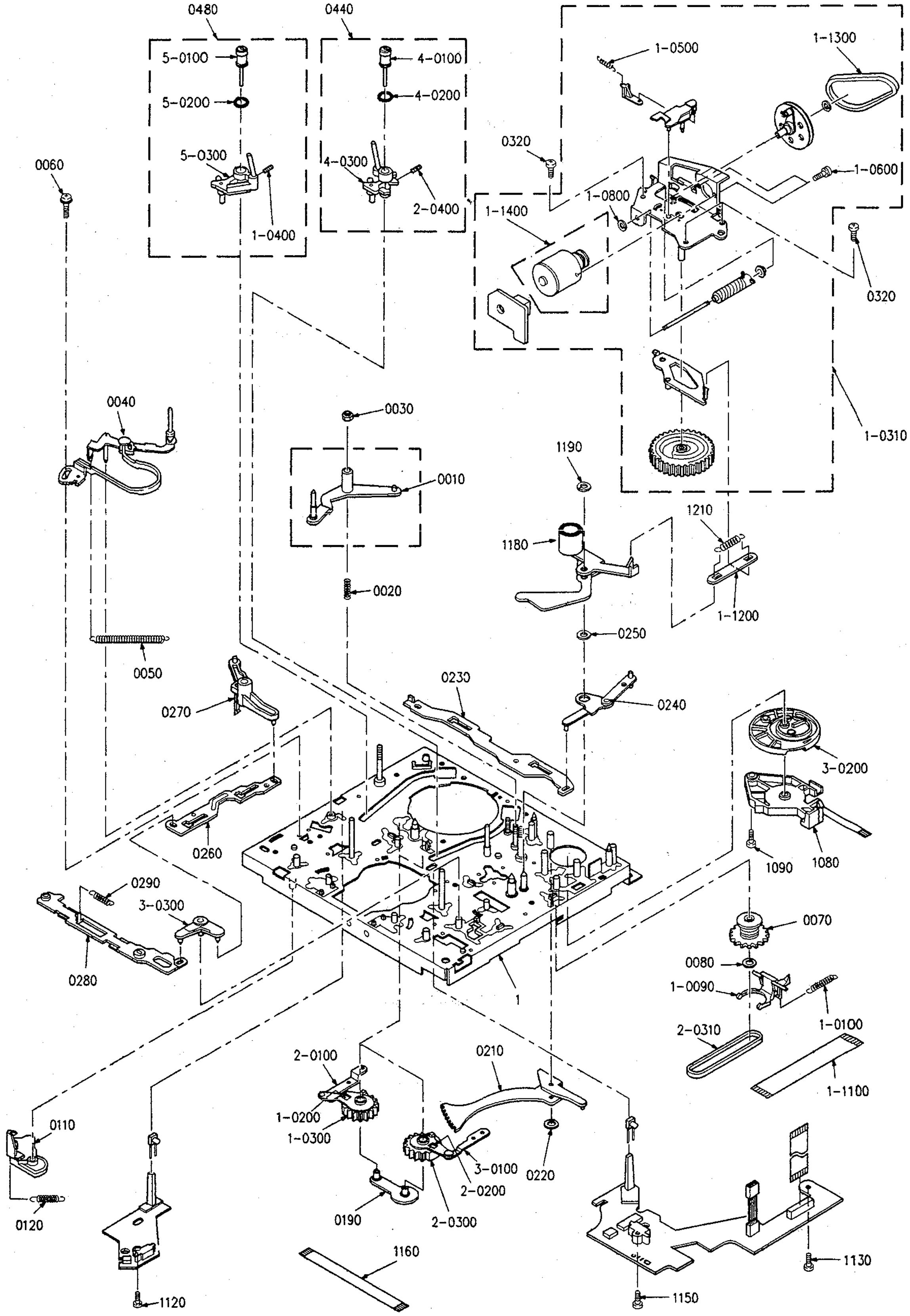
(5) Mechanical Parts (1)


3-0600
6-0300
7-0200
4-0400
2-0700
7-0100
3-0500
1040
1020
1050
0430
0410
0390
0334
0380
0332
0370
0360
0340
0350
1010
1-1000
3-0800
0295
HEATER HOLDER
02101
02101
8-0200
02101

(6) Mechanical Parts (2)


0580
0590
0550
0570
0650
0610
0545
0630
0640
0585
1-0620
1070
1-0700
6-0100
3-0400
1-0900
0540
2-0800
1-0530
2-0600
2-0500
6-0200
8-0100
2-0800
2-0800
1-0900
1-0900
4
1170

(7) Mechanical Parts (3)


0480
0440
5-0100
5-0200
5-0300
1-0400
4-0100
4-0200
4-0300
2-0400
0060
1-0500
1-1300
0320
1-0600
1-0800
1-1400
0320
1-0310
0040
0030
0010
1190
1180
1210
1-1200
0020
0250
0050
0270
0230
0240
3-0200
0260
1090
1080
0290
3-0300
0280
0070
0080
1-0090
1
1-0100
2-0310
1-1100
2-0100
0210
1-0200
1-0300
0110
3-0100
2-0200
0220
0120
0190
2-0300
1160
1130
1120
1150

2. PARTS LIST

- MECHANICAL PARTS -

LOCATION NUMBER	PART NUMBER	DESCRIPTION
0010	70030076	Guide Assy
0020	70030149	Spring
0030	70070003	Nut, 3x3mm
0040	70030020	Tension Regulator Assy
0050	70030677	Spring
0060	70070006	Screw, 3x10mm
0070	70030021	FL Drive Gear Assy
0075	70030456	Screw 3x0.5x8mm
0080	70070012	Washer, 1.6x0.35mm
1-0090	70030352	Lever
2-0090	70050144	Bottom
1-0100	70030386	Spring
2-0100	70030047	Link Assy
3-0100	70030022	Link Assy
4-0100	70030070	Roller Assy
5-0100	70030059	Roller Assy
6-0100	70030034	Idle Gear Assy
7-0100	70030040	ACE Main Base Assy
8-0100	70030630	Capstan Motor Assy
9-0100	70030036	Front Loading Assy
10-0100	70030031	Cassette Holder Assy
0110	70030268	Lever
0120	70030150	Spring
0190	70030201	Stopper
1-0200	70030306	Spring
2-0200	70030151	Spring
3-0200	70030233	Cam
4-0200	70070040	O-ring
5-0200	70070040	O-ring
6-0200	70030039	Clutch Assy
7-0200	70030058	ACE Head Sub Assy
8-0200	70050340	Cylinder Assy
9-0200	70030273	Gear
0210	70030054	Loading Drive Assy
0220	70070014	Washer, 3.6x8x0.5mm
0230	70030152	Slider
0240	70030055	Logic Connector
0245	70030624	Screw 3x14mm
0250	70070038	Washer, 4.1x6.5x0.5mm
0260	70030202	Connector
0270	70030048	Cam Lever Assy
0280	70030353	Slider
0290	70030153	Spring
0295	70030634	Dew Heater Assy
1-0300	70030305	Supply Loading Gear
2-0300	70030387	Take Up Loading Gear
3-0300	70030406	Lever
4-0300	70030069	Slider Assy
5-0300	70030063	Slider Assy
6-0300	70030178	Shaft
7-0300	70030315	Spring
8-0300	70030370	Slider
1-0310	70030060	Loading Drive Assy
2-0310	70030640	FL Drive Belt
0320	70070025	Screw, 2.6x6mm
0332	70030633	FE Head
0334	70070028	Screw, 2.6x6mm
0340	70030154	Lever
0350	70030269	Spring
0360	70030155	Flange
0370	70030270	Impedance Roller
0380	70030203	Sleeve
0390	70070003	Nut, 3x3mm
1-0400	70070039	Screw, 2x3mm
2-0400	70070039	Screw, 2x3mm
3-0400	70030066	Gear Lever Assy
4-0400	70030250	Spring
5-0400	70030056	Hold Guide Assy
6-0400	70070011	Screw, 3x0.5x8mm
0410	70030388	Guide Sleeve
0430	70030204	Cap
0440	70050142	Take UP Slider Assy
0480	70050116	Supply Slider Assy
1-0500	70030303	Spring
2-0500	70030035	Direct Gear Assy
3-0500	70070015	E Ring
4-0500	70030024	Front Loading Worm Assy
0525	70030245	Bracket
1-0530	70070025	Screw, 2.6x6mm
2-0530	70050169	Cassette Door
0540	70070036	Screw, 3x3mm
0545	70030247	Spacer
0550	70030072	S Reel Table Assy
0560	70050228	Front Panel
0570	70030205	Lever
0580	70030156	Spring
0585	70030247	Spacer
0590	70030628	Take Up Reel Assy
1-0600	70070019	Screw, 3x4mm
2-0600	70030415	Spring
3-0600	70070011	Screw, 3x0.5x8mm
4-0600	70070037	FL Switch
5-0600	70070141	Flap Front Assy
0610	70030023	Reverse Brake Assy
1-0620	70030234	Spring
2-0620	70030476	Top Cover
0630	70030071	Supply Brake Assy
0640	70030064	Take Up Brake Assy
0650	70030157	Spring
1-0700	70070020	Screw, 2.6x3mm
2-0700	70030251	Adjust Screw
3-0700	70030364	Spring
0720	70060038	Packing(U)
0725	70060037	Packing(L)
0740	70060189	Case
1-0800	70070008	Washer, 1.6x0.35mm
2-0800	70070026	Washer, 5.4x3.1x0.5mm
3-0800	70030006	Upper Cylinder Assy
4-0800	70030354	Arm Gear (R)
5-0800	70010003	Remote Control Unit
0810	70010198	ANT Cable, PAL
0820	70010354	Mains Cord
1-0900	70070041	Washer, 2.6x6x0.5mm
2-0900	70030407	Spring
1-1000	70030438	Screw 3x10mm
2-1000	70030272	Worm Wheel
1010	70030438	Screw 3x10mm
1020	70030385	Spring
1040	70070005	Nut
1050	70030148	Taper Nut
1070	70070001	Screw, 2.6x6mm
1080	70030631	Cam Switch Assy
1090	70070025	Screw, 2.6x6mm
1-1100	70030083	Wire, FFC
2-1100	70030200	Spring
1120	70070011	Screw, 3x0.5x8mm
1130	70070025	Screw, 2.6x6mm
1150	70070011	Screw, 3x0.5x8mm
1160	70030084	Wire, FFC
1170	70030639	Reel Belt
1180	70030635	Pinch Assy
1190	70070014	Washer, 3.6x8x0.5mm
1-1200	70030324	Connector
2-1200	70030161	Lever
1210	70030350	Spring
1-1300	70030393	Belt
2-1300	70030207	Spring
1-1400	70030044	Loading Motor Assy
2-1400	70030334	Lever
1500	70030033	Holder Guide Assy
1600	70030355	Arm Gear (L)
1700	70030390	Spring
1800	70030025	Door Lever Assy
2200	70030030	Shaft Assy
2300	70030389	Opener
2400	70030236	Lever
2500	70070011	Screw, 3x0.5x8mm

LOCATION NUMBER	PART NUMBER	DESCRIPTION
2600	70070032	Screw, 3x0. 5x5mm
2700	70070042	Screw, 3x16mm
2800	70070022	Washer, 2. 6x5x0. 5mm
2900	70070002	Washer, 2. 6x8. 0x0. 5mm
3000	70070031	Washer, 3. 6x6x0. 5mm
3100	70030237	Spring
3102	70030267	Slot In Guide L
3104	70070004	Screw, 3x5mm
3106	70030199	Slot In Guide R
3108	70070004	Screw, 3x5mm
3200	70030159	Bracket
9005	70060102	Instruction Book
9050	70060070	Caution Sheet
9065	70060111	Quick Reference

LOCATION NUMBER	PART NUMBER	DESCRIPTION	
		DIFFERENCE LIST	
V120F			
1-0050	70050170	Magnet Ratch	
0155	70030664	Screw	2. 6x6mm
0560	70050157	Front Panel	
5-0600	70050244	Door	
0720	70050165	Packing(U)	
0725	70050166	Packing(L)	
0740	70060205	Case	
9005	70060113	Instruction Book	
V130F			
0040	70050253	Window(R)	
1-0050	70050170	Magnet Ratch	
0155	70030664	Screw	2. 6x6mm
0530	70050251	Cassette Door	
0560	70050252	Front Panel	
5-0600	70050254	Door	
0720	70050165	Packing(U)	
0725	70050166	Packing(L)	
0740	70060211	Case	
9005	70060113	Instruction Book	
V170F			
0155	70030664	Screw	2. 6x6mm
0245	--------	Not Used	
0530	70050234	Cassette Door	
0560	70050235	Front Panel	
5-0600	70050172	Door Assy	
0620	70050090	Top Cover	
0740	70060196	Case	
9005	70060114	Instruction Book	
V180F			
1-0050	70050170	Magnet Ratch	
0155	70030664	Screw	2. 6x6mm
0245	--------	Not Used	
0530	70050257	Cassette Door	
0560	70050258	Front Panel	
5-0600	70050261	Door	
0620	70050090	Top Cover	
0720	70050165	Packing(U)	
0725	70050166	Packing(L)	
0740	70060213	Case	
9005	70060115	Instruction Book	

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
		- ELECTRICAL PARTS -		
■4000	70090038	P C Board Assy	Pre Amp	
		- INTEGRATED CIRCUITS -		
IB01	70010171	IC	BA7212S	
		- TRANSISTORS -		
TB11	70010134	Transistor	BC548B	
		- COILS -		
LB17	23238914	Coil, Peaking	TRF4470AC	
LB19	23238914	Coil, Peaking	TRF4470AC	
		- CAPACITORS -		
CB01	70040017	Cap, Ceramic	56PF	J 50V
CB02	70040052	Cap, Plastic	100NF	M 63V
CB03	70040723	Cap, Electrolytic	1MF	M 50V
CB04	70040016	Cap, Ceramic	47PF	J 50V
CB05	70040052	Cap, Plastic	100NF	M 63V
CB06	70040723	Cap, Electrolytic	1MF	M 50V
CB07	70040723	Cap, Electrolytic	1MF	M 50V
CB10	70040016	Cap, Ceramic	47PF	J 50V
CB11	70040035	Cap, Ceramic	22NF	N 16V
CB15	70040723	Cap, Electrolytic	1MF	M 50V
CB17	24630850	Cap, Electrolytic	47MF	M 16V
CB18	70040035	Cap, Ceramic	22NF	N 16V
CB19	24630850	Cap, Electrolytic	47MF	M 16V
CB21	70040035	Cap, Ceramic	22NF	N 16V
CB22	70040723	Cap, Electrolytic	1MF	M 50V
CB23	70040022	Cap, Ceramic	62PF	J 50V
CB24	70040018	Cap, Ceramic	10PF	J 50V
CB25	70040723	Cap, Electrolytic	1MF	M 50V
		- RESISTORS -		
RB02	70040168	Res, Carbon	10	J 1/6W
RB03	70040172	Res, Carbon	330	J 1/6W
RB05	70040168	Res, Carbon	10	J 1/6W
RB06	70040172	Res, Carbon	330	J 1/6W
RB07	70040159	Res, Carbon	1. 5K	J 1/6W
RB08	70040137	Res, Carbon	56	J 1/6W
RB10	70040117	Res, Carbon	4. 7K	J 1/4W
RB11	70040159	Res, Carbon	1. 5K	J 1/6W
RB12	70040098	Res, Carbon	82	J 25V
RB14	70040142	Res, Carbon	820	J 1/6W
RB15	70040142	Res, Carbon	820	J 1/6W
RB16	70040109	Res, Carbon	100	J 1/4W
RB21	70040142	Res, Carbon	820	J 1/6W
RB25	70040182	Res, Carbon	82	J 1/6W
RB28	70040160	Res, Carbon	220	J 1/6W
RB29	70040160	Res, Carbon	220	J 1/6W
■0040	70090052	P C Board Assy	Power	
		- TRANSISTORS -		
TP01	70010147	Transistor	BD202	
TP02	70010132	Transistor	BC547B	
TP03	70010147	Transistor	BD202	
TP04	70010132	Transistor	BC547B	
TP06	70010141	Transistor	BC556B	
TP23	70010134	Transistor	BC548B	
TP24	70010134	Transistor	BC548B	
TP31	70010517	Transistor	BC369	
TP32	70010134	Transistor	BC548B	
		- DIODES -		
⚠DP01	70010154	Diode	1N4004	
⚠DP02	70010154	Diode	1N4004	
DP04	70010628	Diode, Zener	ZTK33B	
DP06	70010158	Diode, Zener	ZPD24	
DP07	70010161	Diode, Zener	ZPD6V8	
DP08	70010159	Diode, Zener	ZPY15	
DP09	70010161	Diode, Zener	ZPD6V8	
DP10	70010453	Diode	1N4001	
DP11	70010159	Diode, Zener	ZPY15	
⚠DP12	70010709	Rectifier	S4VB10	
⚠DP13	70010709	Rectifier	S4VB10	
⚠DP14	70010709	Rectifier	S4VB10	
DP26	70010155	Diode, Zener	ZPD8. 2	
		- COILS -		
⚠LP01	70010093	Filter		
⚠LP02	70010263	Power Transformer		
		- CAPACITORS -		
⚠CP01	70040056	Cap, Plastic	100NF	M 275V
⚠CP06	24795222	Cap, Electrolytic	2200MF	M 25V
⚠CP07	24795222	Cap, Electrolytic	2200MF	M 25V
⚠CP08	24794472	Cap, Electrolytic	4700MF	M 16V
⚠CP09	24799101	Cap, Electrolytic	100MF	M 63V
⚠CP11	24799101	Cap, Electrolytic	100MF	M 63V
CP13	24797100	Cap, Electrolytic	10MF	M 50V
CP14	24797100	Cap, Electrolytic	10MF	M 50V
CP15	70040725	Cap, Electrolytic	100	M 25V
CP16	70040725	Cap, Electrolytic	100	M 25V
		- RESISTORS -		
⚠RP01	70040125	Res, Carbon	47	J 0. 3W
⚠RP02	70040122	Res, Carbon	1	J 0. 3W
RP03	70040719	Res, Oxide Metal	2. 2	J 2W
RP06	70040107	Res, Carbon	10K	J 1/4W
RP07	70040112	Res, Carbon	3. 9	J 1/4W
RP08	70040115	Res, Carbon	22	J 1/4W
RP09	70040104	Res, Carbon	270	J 1/4W
RP11	70040111	Res, Carbon	1. 8	J 1/4W
RP13	70040128	Res, Metal	2. 1	0. 4W
RP14	70040129	Res, Wire Wound	470	
RP15	70040115	Res, Carbon	22	J 1/4W
RP16	70040104	Res, Carbon	270	J 1/4W
RP17	70040113	Res, Carbon	18K	J 1/4W
RP18	70040111	Res, Carbon	1. 8	J 1/4W
RP19	70040127	Res, Metal	1. 69	0. 4W
RP21	70040109	Res, Carbon	100	J 1/4W
RP22	70040105	Res, Carbon	10K	J 1/4W
RP23	70040108	Res, Carbon	5. 6	J 1/4W
RP24	70040117	Res, Carbon	4. 7K	J 1/4W
RP25	70040100	Res, Carbon	8. 2	J 1/4W
RP26	70040118	Res, Carbon	4. 7K	J 1/4W
RP31	70040547	Res, Carbon	1K	J 1/4W
RP32	70040117	Res, Carbon	4. 7K	J 1/4W
RP33	70040108	Res, Carbon	5. 6	J 1/4W
RP34	70040543	Res, Carbon	15K	J 1/4W
		- MISCELLANEOUS -		
⚠BP01	70010208	Appliance Inlet		
BP02	70030540	Connector		
⚠FP01	70010129	Fuse	0. 63A, 250V	
⚠FP011	70010207	Fuse Holder		
⚠FP02	70010130	Fuse	2A, 250V	
⚠FP021	70010207	Fuse Holder		
⚠FP03	70010130	Fuse	2A, 250V	
⚠FP031	70010207	Fuse Holder		
■0180	70090099	P C Board Assy	Terminal	
		- INTEGRATED CIRCUITS -		
IB01	70010664	IC	HEF4053BT	
IB21	70010664	IC	HEF4053BT	
		- TRANSISTORS -		
TB04	70010132	Transistor	BC547B	
TB05	70010132	Transistor	BC547B	
TB07	70010132	Transistor	BC547B	
TB16	70010136	Transistor	BC557B	
TB20	70010132	Transistor	BC547B	
TB23	70010136	Transistor	BC557B	
TB26	70010132	Transistor	BC547B	
TB28	70010516	Transistor	BC547C	
TB31	70010132	Transistor	BC547B	
TB38	70010134	Transistor	BC548B	
TB39	70010137	Transistor	BC558B	
		- CAPACITORS -		
CB01	24206229	Cap, Electrolytic	2. 2MF	M 50V
CB04	24206229	Cap, Electrolytic	2. 2MF	M 50V
CB05	24205479	Cap, Electrolytic	4. 7MF	M 35V
CB06	70040723	Cap, Electrolytic	1MF	M 50V
CB07	70040721	Cap, Electrolytic	22MF	M 16V
CB08	70040535	Cap, Electrolytic	10MF	M 10V
CB12	70040478	Cap, Ceramic	22NF	Z 25V
CB13	70040478	Cap, Ceramic	22NF	Z 25V
CB16	70040530	Cap, Electrolytic	100MF	M 16V
CB18	70040530	Cap, Electrolytic	100MF	M 16V

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
CB21	70040530	Cap, Electrolytic	100MF	M 16V
CB22	70040530	Cap, Electrolytic	100MF	M 16V
CB26	70040509	Cap, Electrolytic	470MF	M 16V
CB28	70040438	Cap, Electrolytic	470MF	M 63V
CB53	24203100	Cap, Electrolytic	10MF	M 16V
CB54	70040541	Cap, Ceramic	470PF	J 50V
CB55	70040478	Cap, Ceramic	22NF	Z 25V
CB62	70040479	Cap, Ceramic	330PF	K 50V
		- RESISTORS -		
RB01	70040587	Res, Carbon	3. 9K	J 0. 1W
RB02	70040583	Res, Carbon	18K	J 0. 1W
RB03	70040575	Res, Carbon	330	J 0. 1W
RB04	70040574	Res, Carbon	1K	J 0. 1W
RB05	70040589	Res, Carbon	100K	J 0. 1W
RB06	70040584	Res, Carbon	47K	J 0. 1W
RB07	70040574	Res, Carbon	1K	J 0. 1W
RB08	70040548	Res, Carbon	33K	J 1/4W
RB11	70040578	Res, Carbon	10K	J 0. 1W
RB12	70040578	Res, Carbon	10K	J 0. 1W
RB13	70040593	Res, Carbon	100	J 0. 1W
RB14	70040592	Res, Carbon	22K	J 0. 1W
RB15	70040581	Res, Carbon	15K	J 0. 1W
RB16	70040582	Res, Carbon	2. 2K	J 0. 1W
RB17	70040579	Res, Carbon	2. 4K	J 0. 1W
RB18	70040574	Res, Carbon	1K	J 0. 1W
RB19	70040595	Res, Carbon	820	J 0. 1W
RB20	70040574	Res, Carbon	1K	J 0. 1W
RB21	70040597	Res, Carbon	560	J 0. 1W
RB22	70040592	Res, Carbon	22K	J 0. 1W
RB23	70040582	Res, Carbon	2. 2K	J 0. 1W
RB24	70040581	Res, Carbon	15K	J 0. 1W
RB25	70040577	Res, Carbon	1. 5K	J 0. 1W
RB26	70040582	Res, Carbon	2. 2K	J 0. 1W
RB27	70040588	Res, Carbon	68	J 0. 1W
RB28	70040596	Res, Carbon	220	J 0. 1W
RB29	70040594	Res, Carbon	5. 6K	J 0. 1W
RB30	70040594	Res, Carbon	5. 6K	J 0. 1W
RB31	70040589	Res, Carbon	100K	J 0. 1W
RB32	70040584	Res, Carbon	47K	J 0. 1W
RB33	70040543	Res, Carbon	15K	J 1/4W
RB35	70040592	Res, Carbon	22K	J 0. 1W
RB36	70040580	Res, Carbon	8. 2K	J 0. 1W
RB37	70040574	Res, Carbon	1K	J 0. 1W
RB38	70040591	Res, Carbon	4. 7K	J 0. 1W
RB39	70040592	Res, Carbon	22K	J 0. 1W
RB42	70040592	Res, Carbon	22K	J 0. 1W
RB60	70040593	Res, Carbon	100	J 0. 1W
RB61	70040593	Res, Carbon	100	J 0. 1W
RB63	70040588	Res, Carbon	68	J 0. 1W
RB64	70040586	Res, Carbon	75	J 0. 1W
		- MISCELLANEOUS -		
BB11	70010209	Socket		
BB13	70010209	Socket		
■0240	70090101	P C Board Assy	Main	
		- INTEGRATED CIRCUITS -		
IE20	70010528	IC	M51645P	
IF21	70010172	IC	MSM7401RS	
IN26	70119859	IC	BA7258AS	
IN63	70010463	IC	BA7024	
IS18	70010167	IC	BA7767	
IT01	70010177	IC	MC6801U4	
IT06	70010169	IC	BA6109	
IT18	70010166	IC	U2561B	
IT46	70010170	IC	U2559B	
IW18	70010174	IC	MC14094BCP	
IW27	70010174	IC	MC14094BCP	
IW28	70119971	IC	MC74HC4053N	
		- TRANSISTORS -		
TE13	70010134	Transistor	BC548B	
TE43	70010134	Transistor	BC548B	
TE48	70010134	Transistor	BC548B	
TE50	70010134	Transistor	BC548B	
TE61	70010134	Transistor	BC548B	
TF02	70010134	Transistor	BC548B	

LOCATION NUMBER	PART NUMBER	DESCRIPTION	
TF06	70010134	Transistor	BC548B
TF09	70010137	Transistor	BC558B
TF26	70010134	Transistor	BC548B
TF32	70010134	Transistor	BC548B
TF33	70010134	Transistor	BC548B
TF37	70010134	Transistor	BC548B
TN02	70010134	Transistor	BC548B
TN11	70010134	Transistor	BC548B
TN23	70010134	Transistor	BC548B
TN34	70010134	Transistor	BC548B
TN42	70010134	Transistor	BC548B
TN47	70010137	Transistor	BC558B
TN49	70010137	Transistor	BC558B
TN56	70010134	Transistor	BC548B
TN57	70010134	Transistor	BC548B
TN58	70010137	Transistor	BC558B
TN59	70010134	Transistor	BC548B
TN71	70010518	Transistor	BC558A
TN74	70010134	Transistor	BC548B
TN81	70010137	Transistor	BC558B
TN82	70010134	Transistor	BC548B
TN87	70010134	Transistor	BC548B
TN91	70010134	Transistor	BC548B
TN95	70010134	Transistor	BC548B
TS26	70010131	Transistor	BC337-40
TT02	70010132	Transistor	BC547B
TT03	70010132	Transistor	BC547B
TT06	70010132	Transistor	BC547B
TT10	70010132	Transistor	BC547B
TT19	70010132	Transistor	BC547B
TT24	70010136	Transistor	BC557B
TT26	70010132	Transistor	BC547B
TT33	70010136	Transistor	BC557B
TT64	70010149	Transistor	BD435
TT66	70010132	Transistor	BC547B
TT68	70010136	Transistor	BC557B
TT71	70010519	Transistor	BD676
TT75	70010136	Transistor	BC557B
TT76	70010136	Transistor	BC557B
TT80	70010136	Transistor	BC557B
TW03	70010137	Transistor	BC558B
TW14	70010139	Transistor	BC558C
TW18	70010134	Transistor	BC548B
TW20	70010142	Transistor	BC327-40
TW49	70010134	Transistor	BC548B
TW51	70010142	Transistor	BC327-40
TW54	70010142	Transistor	BC327-40
TW56	70010134	Transistor	BC548B
TW57	70010142	Transistor	BC327-40
TX01	70010132	Transistor	BC547B
		- DIODES -	
DE21	70010152	Diode	1N4148
DN47	70010152	Diode	1N4148
DN58	70010152	Diode	1N4148
DS02	70010152	Diode	1N4148
DT14	70010155	Diode, Zener	ZPD8. 2
DT15	70010524	Diode	ZPD11
DT31	70010152	Diode	1N4148
DT38	70010152	Diode	1N4148
DT46	70010152	Diode	1N4148
DT53	70010525	Diode	ZPD5. 1
DT64	70010152	Diode	1N4148
DT66	70010152	Diode	1N4148
DT71	70010152	Diode	1N4148
DT73	70010152	Diode	1N4148
DW26	70010152	Diode	1N4148
DW27	70010152	Diode	1N4148
DW53	70010152	Diode	1N4148
		- COILS -	
LE08	70010493	Coil, Peaking	
LE37	70010491	Coil, Peaking	
LF01	70010104	Coil, Peaking	
LF02	23237985	Coil, Peaking	TRF4150AC
LF04	70010488	Coil, Peaking	
LF08	70010485	Coil, Peaking	

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
LF09	23237983	Coil, Peaking	TRF4220AC	
LF11	23238915	Coil, Peaking	TRF4390AC	
LF24	23237985	Coil, Peaking	TRF4150AC	
LF25	70010490	Coil, Peaking		
LN21	70010478	Coil, Peaking		
LN22	23237972	Coil, Peaking	TRF4181AC	
LN24	70010489	Coil, Peaking		
LN40	23238918	Coli, Peaking	TRF4220AC	
LN56	70010097	Coil, Peaking		
LN88	70010478	Coil, Peaking		
LN89	70010104	Coil, Peaking		
LS04	70010105	Coil, Peaking		
LS26	70010428	Coil, Peaking		
LW01	23238918	Coli, Peaking	TRF4220AC	
LW02	23238918	Coli, Peaking	TRF4220AC	
		- CAPACITORS -		
CE01	24203100	Cap, Electrolytic	10MF	M 16V
CE08	70040013	Cap, Ceramic	22PF	J 50V
CE09	70040475	Cap, Ceramic	120PF	J 50V
CE12	70040508	Cap, Plastic	10NF	K 63V
CE14	70040535	Cap, Electrolytic	10MF	M 10V
CE16	70040013	Cap, Ceramic	22PF	J 50V
CE17	70040535	Cap, Electrolytic	10MF	M 10V
CE18	70040539	Cap, Ceramic	330PF	J 50V
CE19	70040033	Cap, Ceramic	10NF	N 25V
CE21	70040033	Cap, Ceramic	10NF	N 25V
CE22	70040033	Cap, Ceramic	10NF	N 25V
CE23	70040033	Cap, Ceramic	10NF	N 25V
CE24	70040476	Cap, Ceramic	22PF	J 50V
CE26	70040033	Cap, Ceramic	10NF	N 25V
CE27	70040033	Cap, Ceramic	10NF	N 25V
CE28	70040033	Cap, Ceramic	10NF	N 25V
CE29	70040033	Cap, Ceramic	10NF	N 25V
CE32	70040506	Cap, Plastic	2. 2NF	M 63V
CE36	70040024	Cap, Ceramic	150PF	K 50V
CE37	70040776	Cap, Ceramic	68PF	G 50V
CE38	70040726	Cap, Ceramic	5. 6PF	K 50V
CE41	24633100	Cap, Electrolytic	10MF	M 16V
CE51	70040723	Cap, Electrolytic	1MF	M 50V
CE54	70040538	Cap, Ceramic	270PF	J 50V
CE56	70040538	Cap, Ceramic	270PF	J 50V
CE57	70040535	Cap, Electrolytic	10MF	M 10V
CE58	70040013	Cap, Ceramic	22PF	J 50V
CE59	70040033	Cap, Ceramic	10NF	N 25V
CE63	70040035	Cap, Ceramic	22NF	N 16V
CE64	70040530	Cap, Electrolytic	100MF	M 16V
CE66	70040035	Cap, Ceramic	22NF	N 16V
CE67	70040033	Cap, Ceramic	10NF	N 25V
CE68	70040033	Cap, Ceramic	10NF	N 25V
CF02	70040017	Cap, Ceramic	56PF	J 50V
CF03	70040031	Cap, Ceramic	12PF	J 50V
CF04	70040031	Cap, Ceramic	12PF	J 50V
CF06	70040035	Cap, Ceramic	22NF	N 16V
CF07	70040721	Cap, Electrolytic	22MF	M 16V
CF08	70040477	Cap, Ceramic	180PF	K 50V
CF09	70040019	Cap, Ceramic	15PF	J 50V
CF11	70040031	Cap, Ceramic	12PF	J 50V
CF12	70040399	Cap, Ceramic	560PF	K 50V
CF13	70040010	Cap, Ceramic	100PF	J 50V
CF21	24205479	Cap, Electrolytic	4. 7MF	M 35V
CF22	70040032	Cap, Ceramic	1NF	M 50V
CF23	70040033	Cap, Ceramic	10NF	N 25V
CF24	70040023	Cap, Ceramic	82PF	J 50V
CF25	70040021	Cap, Ceramic	4. 7PF	K 50V
CF26	24203100	Cap, Electrolytic	10MF	M 16V
CF27	70040035	Cap, Ceramic	22NF	N 16V
CF28	24205479	Cap, Electrolytic	4. 7MF	M 35V
CF29	70040031	Cap, Ceramic	12PF	J 50V
CF30	70040009	Cap, Ceramic	56PF	J 50V
CF31	70040035	Cap, Ceramic	22NF	N 16V
CF32	70040722	Cap, Electrolytic	47MF	M 16V
CF33	24633100	Cap, Electrolytic	10MF	M 16V
CF36	70040024	Cap, Ceramic	150PF	K 50V
CF37	70040014	Cap, Ceramic	27PF	J 50V
CF38	70040025	Cap, Ceramic	220PF	K 50V

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
CN01	24205479	Cap, Electrolytic	4. 7MF	M 35V
CN02	24206229	Cap, Electrolytic	2. 2MF	M 50V
CN03	24792471	Cap, Electrolytic	470MF	M 6. 3V
CN04	70040721	Cap, Electrolytic	22MF	M 16V
CN06	70040035	Cap, Ceramic	22NF	N 16V
CN07	70040721	Cap, Electrolytic	22MF	M 16V
CN08	70040035	Cap, Ceramic	22NF	N 16V
CN09	24340391	Cap, Ceramic	390PF	J 50V
CN11	70040090	Cap, EL, Non-polar	4. 7MF	M 25V
CN12	70040007	Cap, Ceramic	68PF	J 50V
CN13	70040502	Cap, Plastic	330NF	M 50V
CN14	70040033	Cap, Ceramic	10NF	N 25V
CN16	70040035	Cap, Ceramic	22NF	N 16V
CN18	70040030	Cap, Ceramic	3. 3NF	M 50V
CN20	70040220	Cap, Ceramic	82PF	J 50V
CN21	70040035	Cap, Ceramic	22NF	N 16V
CN22	70040475	Cap, Ceramic	120PF	J 50V
CN23	70040033	Cap, Ceramic	10NF	N 25V
CN24	24633100	Cap, Electrolytic	10MF	M 16V
CN25	70040473	Cap, Ceramic	33PF	J 50V
CN26	70040035	Cap, Ceramic	22NF	N 16V
CN27	70040007	Cap, Ceramic	68PF	J 50V
CN28	70040035	Cap, Ceramic	22NF	N 16V
CN31	70040035	Cap, Ceramic	22NF	N 16V
CN32	70040035	Cap, Ceramic	22NF	N 16V
CN34	70040033	Cap, Ceramic	10NF	N 25V
CN36	70040505	Cap, Plastic	47NF	M 63V
CN37	70040532	Cap, Electrolytic	220MF	M 10V
CN39	70040010	Cap, Ceramic	100PF	J 50V
CN40	70040472	Cap, Ceramic	15PF	J 50V
CN41	70040010	Cap, Ceramic	100PF	J 50V
CN42	70040025	Cap, Ceramic	220PF	K 50V
CN46	70040007	Cap, Ceramic	68PF	J 50V
CN51	70040723	Cap, Electrolytic	1MF	M 50V
CN52	70040035	Cap, Ceramic	22NF	N 16V
CN54	70040723	Cap, Electrolytic	1MF	M 50V
CN61	70040399	Cap, Ceramic	560PF	K 50V
CN62	24794220	Cap, Electrolytic	22MF	16V
CN63	70040010	Cap, Ceramic	100PF	J 50V
CN64	24633100	Cap, Electrolytic	10MF	M 16V
CN66	70040026	Cap, Ceramic	270PF	K 50V
CN67	70040097	Cap, Ceramic	330PF	G 50V
CN68	70040094	Cap, Ceramic	150PF	G 50V
CN69	70040094	Cap, Ceramic	150PF	G 50V
CN72	70040032	Cap, Ceramic	1NF	M 50V
CN77	24206229	Cap, Electrolytic	2. 2MF	M 50V
CN86	70040043	Cap, Plastic	10NF	K 63V
CN88	70040721	Cap, Electrolytic	22MF	M 16V
CN89	70040477	Cap, Ceramic	180PF	K 50V
CN91	70040722	Cap, Electrolytic	47MF	M 16V
CN92	70040722	Cap, Electrolytic	47MF	M 16V
CN95	70040438	Cap, Electrolytic	470MF	M 63V
CS01	24203101	Cap, Electrolytic	100MF	M 16V
CS03	24797330	Cap, Electrolytic	33MF	M 50V
CS04	24205479	Cap, Electrolytic	4. 7MF	M 35V
CS05	70040032	Cap, Ceramic	1NF	M 50V
CS06	24203100	Cap, Electrolytic	10MF	M 16V
CS07	70040500	Cap, Plastic	8. 2NF	J 63V
CS09	24794220	Cap, Electrolytic	22MF	16V
CS10	70040010	Cap, Ceramic	100PF	J 50V
CS11	70040010	Cap, Ceramic	100PF	J 50V
CS12	70040537	Cap, Ceramic	100PF	J 50V
CS13	70040010	Cap, Ceramic	100PF	J 50V
CS14	70040090	Cap, EL, Non-polar	4. 7MF	M 25V
CS16	70040032	Cap, Ceramic	1NF	M 50V
CS18	70040722	Cap, Electrolytic	47MF	M 16V
CS21	24203100	Cap, Electrolytic	10MF	M 16V
CS23	70040027	Cap, Ceramic	1. 5NF	K 50V
CS24	70040723	Cap, Electrolytic	1MF	M 50V
CS26	70040096	Cap, Ceramic	470PF	M 400V
CS27	70040720	Cap, Plastic	22NF	J 250V
CS28	70040499	Cap, Plastic	10NF	K 50V
CS29	70040499	Cap, Plastic	10NF	K 50V
CS31	70040035	Cap, Ceramic	22NF	N 16V
CS32	24794220	Cap, Electrolytic	22MF	16V

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
CS33	70040063	Cap, Electrolytic	33MF	M 16V
CS35	70040008	Cap, Ceramic	470PF	K 50V
CS36	24205479	Cap, Electrolytic	4. 7MF	M 35V
CS37	70040043	Cap, Plastic	10NF	K 63V
CS39	70040032	Cap, Ceramic	1NF	M 50V
CS41	70040034	Cap, Ceramic	15NF	N 25V
CS50	70040064	Cap, Electrolytic	1MF	M 63V
CT01	70040038	Cap, Ceramic	5. 6NF	K 25V
CT08	24633100	Cap, Electrolytic	10MF	M 16V
CT14	70040505	Cap, Plastic	47NF	M 63V
CT15	70040012	Cap, Ceramic	6. 8NF	M 25V
CT16	70040722	Cap, Electrolytic	47MF	M 16V
CT17	24630852	Cap, Electrolytic	22MF	M 16V
CT18	70040064	Cap, Electrolytic	1MF	M 63V
CT19	70040036	Cap, Ceramic	2. 2NF	M 50V
CT20	70040033	Cap, Ceramic	10NF	N 25V
CT22	70040029	Cap, Ceramic	4. 7NF	K 50V
CT32	24633100	Cap, Electrolytic	10MF	M 16V
CT33	70040015	Cap, Ceramic	39PF	J 50V
CT34	70040015	Cap, Ceramic	39PF	J 50V
CT46	70040873	Cap, Plastic	82NF	J 63V
CT47	70040060	Cap, Electrolytic	4MF	M 16V
CT50	24203100	Cap, Electrolytic	10MF	M 16V
CT51	70040504	Cap, Plastic	220NF	M 50V
CT52	24794220	Cap, Electrolytic	22MF	16V
CT64	70040013	Cap, Ceramic	22PF	J 50V
CT66	70040724	Cap, Electrolytic	47MF	M 16V
CT71	70040013	Cap, Ceramic	22PF	J 50V
CT72	70040722	Cap, Electrolytic	47MF	M 16V
CW01	70040010	Cap, Ceramic	100PF	J 50V
CW02	70040010	Cap, Ceramic	100PF	J 50V
CW03	24203101	Cap, Electrolytic	100MF	M 16V
CW04	70040035	Cap, Ceramic	22NF	N 16V
CW05	70040035	Cap, Ceramic	22NF	N 16V
CW10	70040722	Cap, Electrolytic	47MF	M 16V
CW11	70040220	Cap, Ceramic	82PF	J 50V
CW12	24203100	Cap, Electrolytic	10MF	M 16V
CW18	70040035	Cap, Ceramic	22NF	N 16V
CW23	70040715	Cap, Electrolytic	47MF	M 35V
CW27	70040060	Cap, Electrolytic	4MF	M 16V
CW28	70040012	Cap, Ceramic	6. 8NF	M 25V
CW29	70040723	Cap, Electrolytic	1MF	M 50V
CW43	70040722	Cap, Electrolytic	47MF	M 16V
CW51	70040063	Cap, Electrolytic	33MF	M 16V
		- RESISTORS -		
RE01	70040150	Res, Carbon	1K	J 1/6W
RE02	70040150	Res, Carbon	1K	J 1/6W
RE11	70040151	Res, Carbon	560	J 1/6W
RE12	70040150	Res, Carbon	1K	J 1/6W
RE13	70040145	Res, Carbon	10K	J 1/6W
RE14	70040172	Res, Carbon	330	J 1/6W
RE16	70040599	Res, Metal	825	F 1/6W
RE17	70040585	Res, Carbon	2. 2K	G 1/6W
RE18	70040572	Res, Carbon	4. 7K	G 1/6W
RE19	70040138	Res, Carbon	470	J 1/6W
RE32	70040147	Res, Carbon	22K	J 1/6W
RE34	70040139	Res, Carbon	4. 7K	J 1/6W
RE36	70040139	Res, Carbon	4. 7K	J 1/6W
RE37	70040314	Res, Carbon	470	J 1/8W
RE38	70040151	Res, Carbon	560	J 1/6W
RE41	70040187	Res, Carbon	270K	J 1/6W
RE42	70040154	Res, Carbon	3. 9K	J 1/6W
RE43	70040159	Res, Carbon	1. 5K	J 1/6W
RE48	70040153	Res, Carbon	3. 3K	J 1/6W
RE49	70040174	Res, Carbon	2. 2K	J 1/6W
RE50	70040145	Res, Carbon	10K	J 1/6W
RE52	70040141	Res, Carbon	1. 2K	J 1/6W
RE53	70040173	Res, Carbon	680	J 1/6W
RE54	70040155	Res, Carbon	15K	J 1/6W
RE56	70040162	Res, Carbon	8. 2K	J 1/6W
RE58	70040154	Res, Carbon	3. 9K	J 1/6W
RE59	70040150	Res, Carbon	1K	J 1/6W
RE61	70040140	Res, Carbon	1. 8K	J 1/6W
RE62	70040174	Res, Carbon	2. 2K	J 1/6W
RE63	70040150	Res, Carbon	1K	J 1/6W
RF02	70040150	Res. Carbon	1K	J 1/6W
RF03	70040172	Res. Carbon	330	J 1/6W
RF04	70040189	Res. Carbon	1K	G 1/6W
RF06	70040138	Res. Carbon	470	J 1/6W
RF07	70040199	Res. Carbon	430	J 1/6W
RF08	70040174	Res. Carbon	2. 2K	J 1/6W
RF09	70040144	Res. Carbon	270	J 1/6W
RF11	70040138	Res. Carbon	470	J 1/6W
RF12	70040140	Res. Carbon	1. 8K	J 1/6W
RF13	70040162	Res. Carbon	8. 2K	J 1/6W
RF14	70040150	Res. Carbon	1K	J 1/6W
RF20	70040321	Res. Carbon	4. 7K	J 1/8W
RF25	70040164	Res. Carbon	18K	J 1/6W
RF26	70040140	Res. Carbon	1. 8K	J 1/6W
RF27	70040157	Res. Carbon	6. 8K	J 1/6W
RF32	70040150	Res. Carbon	1K	J 1/6W
RF33	70040150	Res. Carbon	1K	J 1/6W
RF34	70040173	Res. Carbon	680	J 1/6W
RF36	70040172	Res. Carbon	330	J 1/6W
RF37	70040156	Res. Carbon	39K	J 1/6W
RF38	70040150	Res. Carbon	1K	J 1/6W
RN01	70040173	Res. Carbon	680	J 1/6W
RN02	70040145	Res. Carbon	10K	J 1/6W
RN03	70040147	Res. Carbon	22K	J 1/6W
RN09	70040174	Res. Carbon	2. 2K	J 1/6W
RN11	70040200	Res. Carbon	910	J 1/6W
RN12	70040150	Res. Carbon	1K	J 1/6W
RN13	70040546	Res. Carbon	560	J 1/4W
RN17	70040560	Res. Carbon	270K	J 0. 14W
RN20	70040316	Res, Carbon	820	J 1/8W
RN21	70040159	Res. Carbon	1. 5K	J 1/6W
RN22	70040151	Res. Carbon	560	J 1/6W
RN23	70040157	Res. Carbon	6. 8K	J 1/6W
RN24	70040173	Res. Carbon	680	J 1/6W
RN26	70040174	Res. Carbon	2. 2K	J 1/6W
RN27	70040199	Res. Carbon	430	J 1/6W
RN28	70040145	Res. Carbon	10K	J 1/6W
RN29	70040146	Res. Carbon	47K	J 1/6W
RN31	70040145	Res. Carbon	10K	J 1/6W
RN32	70040544	Res. Carbon	6. 8K	J 1/4W
RN33	70040149	Res. Carbon	33K	J 1/6W
RN34	70040146	Res. Carbon	47K	J 1/6W
RN35	70040550	Res. Carbon	1. 8K	J 1/4W
RN36	70040183	Res. Carbon	82K	J 1/6W
RN37	70040183	Res. Carbon	82K	J 1/6W
RN38	70040184	Res. Carbon	5. 6K	J 1/6W
RN39	70040139	Res. Carbon	4. 7K	J 1/6W
RN41	70040140	Res. Carbon	1. 8K	J 1/6W
RN42	70040557	Res. Carbon	1. 2K	J 0. 14W
RN43	70040165	Res. Carbon	27K	J 1/6W
RN44	70040154	Res. Carbon	3. 9K	J 1/6W
RN45	70040174	Res. Carbon	2. 2K	J 1/6W
RN46	70040320	Res. Carbon	3. 3K	J 1/8W
RN47	70040165	Res. Carbon	27K	J 1/6W
RN48	70040324	Res. Carbon	22K	J 1/8W
RN49	70040150	Res. Carbon	1K	J 1/6W
RN50	70040150	Res. Carbon	1K	J 1/6W
RN51	70040141	Res. Carbon	1. 2K	J 1/6W
RN52	70040559	Res. Carbon	56K	J 0. 14W
RN56	70040150	Res. Carbon	1K	J 1/6W
RN57	70040150	Res. Carbon	1K	J 1/6W
RN59	70040146	Res. Carbon	47K	J 1/6W
RN60	70040173	Res. Carbon	680	J 1/6W
RN61	70040557	Res. Carbon	1. 2K	J 0. 14W
RN62	70040139	Res. Carbon	4. 7K	J 1/6W
RN64	70040149	Res. Carbon	33K	J 1/6W
RN65	70040146	Res. Carbon	47K	J 1/6W
RN66	70040140	Res. Carbon	1. 8K	J 1/6W
RN67	70040191	Res, Carbon	10K	G 1/6W
RN68	70040208	Res, Metal	100K	F 1/6W
RN69	70040208	Res, Metal	100K	F 1/6W
RN70	70040553	Res. Carbon	56K	J 1/4W
RN71	70040152	Res. Carbon	180	J 1/6W
RN72	70040145	Res. Carbon	10K	J 1/6W
RN73	70040138	Res. Carbon	470	J 1/6W

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
RN74	70040148	Res, Carbon	68K	J 1/6W
RN75	70040172	Res, Carbon	330	J 1/6W
RN76	70040145	Res, Carbon	10K	J 1/6W
RN77	70040155	Res, Carbon	15K	J 1/6W
RN78	70040180	Res, Carbon	2.2M	J 1/6W
RN79	70040155	Res, Carbon	15K	J 1/6W
RN80	70040151	Res, Carbon	560	J 1/6W
RN81	70040184	Res, Carbon	5.6K	J 1/6W
RN82	70040150	Res, Carbon	1K	J 1/6W
RN86	70040321	Res, Carbon	4.7K	J 1/8W
RN87	70040161	Res, Carbon	2.7K	J 1/6W
RN89	70040174	Res, Carbon	2.2K	J 1/6W
RN91	70040162	Res, Carbon	8.2K	J 1/6W
RN92	70040140	Res, Carbon	1.8K	J 1/6W
RN93	70040154	Res, Carbon	3.9K	J 1/6W
RN94	70040141	Res, Carbon	1.2K	J 1/6W
RN95	70040201	Res, Carbon	1.3K	J 1/6W
⚠RS02	70040551	Res, Carbon	3.9	J 1/4W
RS04	70040168	Res, Carbon	10	J 1/6W
RS06	70040149	Res, Carbon	33K	J 1/6W
RS08	70040171	Res, Carbon	100	J 1/6W
RS10	70040161	Res, Carbon	2.7K	J 1/6W
RS11	70040165	Res, Carbon	27K	J 1/6W
RS12	70040139	Res, Carbon	4.7K	J 1/6W
RS13	70040163	Res, Carbon	12K	J 1/6W
RS14	70040213	Res, Metal	51.1K	F 1/6W
RS16	70040208	Res, Metal	100K	F 1/6W
RS17	70040208	Res, Metal	100K	F 1/6W
RS18	70040179	Res, Carbon	1M	J 1/6W
RS22	70040154	Res, Carbon	3.9K	J 1/6W
RS23	70040184	Res, Carbon	5.6K	J 1/6W
RS24	70040163	Res, Carbon	12K	J 1/6W
RS25	70040164	Res, Carbon	18K	J 1/6W
RS26	70040463	Res, Carbon	330K	J 1/6W
RS28	70040156	Res, Carbon	39K	J 1/6W
RS29	70040167	Res, Carbon	4.7	J 1/6W
RS31	70040552	Res, Carbon	6.8	J 1/4W
RS33	70040152	Res, Carbon	180	J 1/6W
RS34	70040149	Res, Carbon	33K	J 1/6W
RS36	70040323	Res, Carbon	10K	J 1/8W
RS41	70040556	Res, Carbon	150	J 0.14W
RT03	70040139	Res, Carbon	4.7K	J 1/6W
RT04	70040174	Res, Carbon	2.2K	J 1/6W
RT05	70040174	Res, Carbon	2.2K	J 1/6W
RT06	70040145	Res, Carbon	10K	J 1/6W
RT07	70040145	Res, Carbon	10K	J 1/6W
RT08	70040145	Res, Carbon	10K	J 1/6W
RT09	70040139	Res, Carbon	4.7K	J 1/6W
RT10	70040145	Res, Carbon	10K	J 1/6W
RT11	70040139	Res, Carbon	4.7K	J 1/6W
RT12	70040139	Res, Carbon	4.7K	J 1/6W
RT13	70040139	Res, Carbon	4.7K	J 1/6W
RT15	70040139	Res, Carbon	4.7K	J 1/6W
RT16	70040145	Res, Carbon	10K	J 1/6W
RT17	70040148	Res, Carbon	68K	J 1/6W
RT18	70040178	Res, Carbon	470K	J 1/6W
RT19	70040145	Res, Carbon	10K	J 1/6W
RT20	70040145	Res, Carbon	10K	J 1/6W
RT21	70040139	Res, Carbon	4.7K	J 1/6W
RT22	70040117	Res, Carbon	4.7K	J 1/4W
RT23	70040145	Res, Carbon	10K	J 1/6W
RT24	70040544	Res, Carbon	6.8K	J 1/4W
RT25	70040171	Res, Carbon	100	J 1/6W
RT26	70040174	Res, Carbon	2.2K	J 1/6W
RT27	70040177	Res, Carbon	220K	J 1/6W
RT28	70040139	Res, Carbon	4.7K	J 1/6W
RT29	70040144	Res, Carbon	270	J 1/6W
RT31	70040139	Res, Carbon	4.7K	J 1/6W
RT32	70040166	Res, Carbon	56K	J 1/6W
RT33	70040150	Res, Carbon	1K	J 1/6W
RT34	70040139	Res, Carbon	4.7K	J 1/6W
RT35	70040139	Res, Carbon	4.7K	J 1/6W
RT36	70040165	Res, Carbon	27K	J 1/6W
RT37	70040157	Res, Carbon	6.8K	J 1/6W
RT38	70040164	Res, Carbon	18K	J 1/6W
RT39	70040138	Res, Carbon	470	J 1/6W
RT40	70040139	Res, Carbon	4.7K	J 1/6W
RT41	70040139	Res, Carbon	4.7K	J 1/6W
RT42	70040153	Res, Carbon	3.3K	J 1/6W
RT43	70040153	Res, Carbon	3.3K	J 1/6W
RT46	70040155	Res, Carbon	15K	J 1/6W
RT48	70040139	Res, Carbon	4.7K	J 1/6W
RT49	70040145	Res, Carbon	10K	J 1/6W
RT50	70040139	Res, Carbon	4.7K	J 1/6W
RT51	70040147	Res, Carbon	22K	J 1/6W
RT52	70040117	Res, Carbon	4.7K	J 1/4W
RT56	70040155	Res, Carbon	15K	J 1/6W
RT57	70040174	Res, Carbon	2.2K	J 1/6W
RT58	70040549	Res, Carbon	330	J 1/4W
RT59	70040545	Res, Carbon	680	J 1/4W
RT61	70040185	Res, Carbon	120	J 1/6W
RT62	70040117	Res, Carbon	4.7K	J 1/4W
RT64	70040178	Res, Carbon	470K	J 1/6W
RT66	70040171	Res, Carbon	100	J 1/6W
RT67	70040149	Res, Carbon	33K	J 1/6W
RT68	70040139	Res, Carbon	4.7K	J 1/6W
RT69	70040145	Res, Carbon	10K	J 1/6W
RT71	70040178	Res, Carbon	470K	J 1/6W
RT72	70040149	Res, Carbon	33K	J 1/6W
RT73	70040171	Res, Carbon	100	J 1/6W
RT74	70040139	Res, Carbon	4.7K	J 1/6W
RT75	70040150	Res, Carbon	1K	J 1/6W
RT76	70040184	Res, Carbon	5.6K	J 1/6W
RT77	70040147	Res, Carbon	22K	J 1/6W
RT78	70040139	Res, Carbon	4.7K	J 1/6W
RT79	70040145	Res, Carbon	10K	J 1/6W
RT80	70040166	Res, Carbon	56K	J 1/6W
RT81	70040139	Res, Carbon	4.7K	J 1/6W
RT82	70040139	Res, Carbon	4.7K	J 1/6W
RT83	70040139	Res, Carbon	4.7K	J 1/6W
RT84	70040150	Res, Carbon	1K	J 1/6W
RT86	70040323	Res, Carbon	10K	J 1/8W
RT87	70040150	Res, Carbon	1K	J 1/6W
RT88	70040146	Res, Carbon	47K	J 1/6W
RT89	70040147	Res, Carbon	22K	J 1/6W
RT91	70040600	Res, Metal	22.1	F 1/6W
RT92	70040141	Res, Carbon	1.2K	J 1/6W
RT93	70040601	Res, Metal	221	F 1/6W
RT94	70040169	Res, Carbon	22	J 1/6W
RW03	70040150	Res, Carbon	1K	J 1/6W
RW04	70040317	Res, Carbon	1K	J 1/8W
RW06	70040150	Res, Carbon	1K	J 1/6W
RW07	70040145	Res, Carbon	10K	J 1/6W
RW11	70040598	Res, Metal	4.32K	F 1/6W
RW12	70040317	Res, Carbon	1K	J 1/8W
RW13	70040176	Res, Carbon	150K	J 1/6W
RW14	70040159	Res, Carbon	1.5K	J 1/6W
RW15	70040139	Res, Carbon	4.7K	J 1/6W
RW16	70040150	Res, Carbon	1K	J 1/6W
RW17	70040157	Res, Carbon	6.8K	J 1/6W
RW18	70040163	Res, Carbon	12K	J 1/6W
RW19	70040139	Res, Carbon	4.7K	J 1/6W
RW21	70040146	Res, Carbon	47K	J 1/6W
RW22	70040147	Res, Carbon	22K	J 1/6W
RW23	70040150	Res, Carbon	1K	J 1/6W
RW24	70040150	Res, Carbon	1K	J 1/6W
RW25	70040141	Res, Carbon	1.2K	J 1/6W
RW26	70040175	Res, Carbon	100K	J 1/6W
RW27	70040323	Res, Carbon	10K	J 1/8W
RW28	70040157	Res, Carbon	6.8K	J 1/6W
RW31	70040146	Res, Carbon	47K	J 1/6W
RW43	70040156	Res, Carbon	39K	J 1/6W
RW44	70040163	Res, Carbon	12K	J 1/6W
RW49	70040558	Res, Carbon	12K	J 0.14W
RW51	70040149	Res, Carbon	33K	J 1/6W
RW52	70040150	Res, Carbon	1K	J 1/6W
RW53	70040161	Res, Carbon	2.7K	J 1/6W
RW54	70040174	Res, Carbon	2.2K	J 1/6W
RW56	70040547	Res, Carbon	1K	J 1/4W
RW57	70040147	Res, Carbon	22K	J 1/6W

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
RW58	70040163	Res, Carbon	12K	J 1/6W
⚠RW60	70040791	Res, Fusible	3.9	J 0.3W
⚠RW61	70040126	Res, Fusible	3.9	
RX01	70040174	Res, Carbon	2.2K	J 1/6W
RX02	70040145	Res, Carbon	10K	J 1/6W
RX03	70040145	Res, Carbon	10K	J 1/6W
PE51	70040606	Res, Variable	470	N 1/10W
PF02	24066955	Res, Variable	1K	
PF32	24066955	Res, Variable	1K	
PN04	70040215	Res, Variable	47K	
PN23	70040217	Res, Variable	4K	
PN31	70040219	Res, Variable	3K	
PN36	70040218	Res, Variable	22K	
PN37	70040218	Res, Variable	22K	
PN38	70040219	Res, Variable	3K	
PS24	70040217	Res, Variable	4K	
PS26	24066949	Res, Variable	100K	
		- MISCELLANEOUS -		
5000	70010474	Tuner		
5005	70010475	F.U.	IF	
5010	70010476	RF Modulator		
FE01	70010513	Filter		
FE11	70010512	Filter		
FE14	70010496	Coil, Variable		
FE38	70010514	Filter	SBP4543	
FE54	70010495	Coil, Variable	1.07MHz	
FE57	70010495	Coil, Variable	1.07MHz	
FE61	70010511	Filter		
FN53	70010506	Delay Line		
FN54	70010124	LPF		
⚠FT53	70010515	Fuse	0.63A, 250V	
FW11	70010114	Filter		
QF37	70010510	Crystal		
QN63	70010443	Resonator, 500KHz		
QT34	70010117	Crystal, 4MHz		
■0565	70090100	P C Board Assy	Key Display	
		- INTEGRATED CIRCUITS -		
IK01	70010176	IC	M8716B	
IK05	70010699	IC	HD404019A46S	
IR01	23120371	F.U	IR-9106-K	
		- TRANSISTORS -		
TK03	70010446	Transistor	BC558	
		- CAPACITORS -		
CK01	70040042	Cap, Ceramic		100V
CK02	70040075	Cap, Electrolytic	10MF	M 16V
CK03	70040018	Cap, Ceramic	10PF	J 50V
CK04	70040033	Cap, Ceramic	10NF	N 25V
CK05	70040075	Cap, Electrolytic	10MF	M 16V
CK07	70040020	Cap, Ceramic	30PF	J 50V
CK08	70040020	Cap, Ceramic	30PF	J 50V
CK09	70040033	Cap, Ceramic	10NF	N 25V
CK10	70040010	Cap, Ceramic	100PF	J 50V
CK11	70040010	Cap, Ceramic	100PF	J 50V
CK12	70040010	Cap, Ceramic	100PF	J 50V
CK13	70040010	Cap, Ceramic	100PF	J 50V
CK14	70040010	Cap, Ceramic	100PF	J 50V
CK15	70040033	Cap, Ceramic	10NF	N 25V
		- RESISTORS -		
RK03	70040139	Res, Carbon	4.7K	J 1/6W
RK04	70040145	Res, Carbon	10K	J 1/6W
RK05	70040175	Res, Carbon	100K	J 1/6W
RK06	70040145	Res, Carbon	10K	J 1/6W
RK07	70040179	Res, Carbon	1M	J 1/6W
RK08	70040153	Res, Carbon	3.3K	J 1/6W
RK09	70040153	Res, Carbon	3.3K	J 1/6W
RK10	70040139	Res, Carbon	4.7K	J 1/6W
RK11	70040139	Res, Carbon	4.7K	J 1/6W
RK13	70040139	Res, Carbon	4.7K	J 1/6W
RK14	70040139	Res, Carbon	4.7K	J 1/6W
RK15	70040145	Res, Carbon	10K	J 1/6W
RK16	70040145	Res, Carbon	10K	J 1/6W
RK17	70040145	Res, Carbon	10K	J 1/6W
RK41	70040166	Res, Carbon	56K	J 1/6W
RK43	70040166	Res, Carbon	56K	J 1/6W

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
RK44	70040166	Res, Carbon	56K	J 1/6W
		- MISCELLANEOUS -		
GK01	70010526	FIP	EFU9MT86GK	
QK01	70010116	Crystal, 32KHz		
QK07	70010119	Resonator, 4MHz		
SK04	23344094	Push Switch		
SK05	23344094	Push Switch		
SK08	23344094	Push Switch		
SK09	23344094	Push Switch		
SK11	23344094	Push Switch		
SK12	23344094	Push Switch		
SK13	23344094	Push Switch		
SK15	23344094	Push Switch		
SK16	23344094	Push Switch		
SK17	23344094	Push Switch		
SK18	23344094	Push Switch		
XK03	70010211	Ni-Cd Battery		
■0575	70090039	P C Board Assy, KEY BOARD		
		- MISCELLANEOUS -		
SK01	23344094	Push Switch		
SK02	23344094	Push Switch		
SK03	23344094	Push Switch		
SK06	23344094	Push Switch		
SK07	23344094	Push Switch		

LOCATION NUMBER	PART NUMBER	DESCRIPTION	
		DIFFERENCE LIST	
V120F			
■0575	70090055	P C Board Assy	Key Board
V130F			
■0575	70090055	P C Board Assy	Key Board
V170F			
■0240	70090097	P C Board Assy	Main
		- INTEGRATED CIRCUITS -	
IT01	70010663	IC	ZC407454CP
IT10	70010166	IC	U2561B
IT18	--------	Not Used	
IT46	--------	Not Used	
IT50	70010170	IC	U2559B
IT80	70010662	IC	MC14020BCP
		- TRANSISTORS -	
TF26	70010573	Transistor	BC548
TF44	70010144	Transistor	BC548C
TF48	70010137	Transistor	BC558B
TF53	70010134	Transistor	BC548B
TN49	70010134	Transistor	BC548B
TN57	--------	Not Used	
TN58	--------	Not Used	
TN60	70010137	Transistor	BC558B
TN63	70010137	Transistor	BC558B
TN75	70010137	Transistor	BC558B
TN80	70010134	Transistor	BC548B
TN85	70010134	Transistor	BC548B
TT01	70010573	Transistor	BC548
TT02	70010573	Transistor	BC548
TT03	--------	Not Used	
TT06	70010573	Transistor	BC548
TT10	--------	Not Used	
TT19	--------	Not Used	
TT20	70010573	Transistor	BC548
TT24	--------	Not Used	
TT26	--------	Not Used	
TT33	--------	Not Used	
TT36	70010573	Transistor	BC548
TT37	70010446	Transistor	BC558
TT43	70010446	Transistor	BC558
TT44	70010446	Transistor	BC558
TT46	70010573	Transistor	BC548
TT60	70010137	Transistor	BC558B
TT66	--------	Not Used	
TT68	--------	Not Used	
TT70	70010573	Transistor	BC548
TT75	--------	Not Used	
TT76	--------	Not Used	
TT77	70010446	Transistor	BC558
TT78	70010573	Transistor	BC548
TT80	--------	Not Used	
TT83	70010573	Transistor	BC548
TW04	70010134	Transistor	BC548B
TW49	70010573	Transistor	BC548
TW56	70010573	Transistor	BC548
TX01	70010574	Transistor	BC547
		- DIODES -	
DF48	70010152	Diode	1N4148
DT06	70010155	Diode, Zener	ZPD8.2
DT07	70010524	Diode	ZPD11
DT14	--------	Not Used	
DT15	--------	Not Used	
DT21	70010152	Diode	1N4148
DT22	70010152	Diode	1N4148
DT24	70010152	Diode	1N4148
DT27	70010152	Diode	1N4148
DT31	--------	Not Used	
DT38	--------	Not Used	
DT46	--------	Not Used	
DT51	70010152	Diode	1N4148
DT53	--------	Not Used	
DT64	--------	Not Used	
DT66	--------	Not Used	

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
DT70	70010525	Diode	ZPD5.1	
DT71	--------	Not Used		
DT72	70010152	Diode	1N4148	
DT73	--------	Not Used		
		- COILS -		
LF01	70010485	Coil, Peaking		
LF03	70010488	Coil, Peaking		
LF08	23238912	Coil, Peaking	TRF4680AC	
LF45	23238916	Coil, Peaking	TRF4330AC	
LF46	70010490	Coil, Peaking		
LN40	23237983	Coil, Peaking	TRF4220AC	
LN89	70010485	Coil, Peaking		
LT01	70010756	Coil, Choke		
LW06	23238915	Coil, Peaking	TRF4390AC	
LW08	70010642	Coil, Peaking		
LW37	23238916	Coil, Peaking	TRF4330AC	
		- CAPACITORS -		
CE14	24203100	Cap, Electrolytic	10MF	M 16V
CE17	24203100	Cap, Electrolytic	10MF	M 16V
CE37	70040474	Cap, Ceramic	68PF	J 50V
CE41	24203100	Cap, Electrolytic	10MF	M 16V
CE54	70040741	Cap, Ceramic	270PF	K 50V
CE56	70040741	Cap, Ceramic	270PF	K 50V
CE57	24203100	Cap, Electrolytic	10MF	M 16V
CF33	24203100	Cap, Electrolytic	10MF	M 16V
CF44	70040035	Cap, Ceramic	22NF	N 16V
CF45	70040088	Cap, Electrolytic	22MF	M 16V
CF46	70040035	Cap, Ceramic	22NF	N 16V
CF47	70040027	Cap, Ceramic	1.5NF	K 50V
CF49	70040035	Cap, Ceramic	22NF	N 16V
CF53	70040877	Cap, Plastic	33NF	M 63V
CN03	--------	Not Used		
CN11	24205479	Cap, Electrolytic	4.7MF	M 35V
CN12	70040220	Cap, Ceramic	82PF	J 50V
CN24	24203100	Cap, Electrolytic	10MF	M 16V
CN27	70040009	Cap, Ceramic	56PF	J 50V
CN37	70040878	Cap, Electrolytic	220MF	M 16V
CN39	70040537	Cap, Ceramic	100PF	J 50V
CN56	70040530	Cap, Electrolytic	100MF	M 16V
CN62	70040721	Cap, Electrolytic	22MF	M 16V
CN64	24203100	Cap, Electrolytic	10MF	M 16V
CN85	70040035	Cap, Ceramic	22NF	N 16V
CN86	70040033	Cap, Ceramic	10NF	N 25V
CS01	70040509	Cap, Electrolytic	470MF	M 16V
CS03	70040722	Cap, Electrolytic	47MF	M 16V
CS07	70040736	Cap, Plastic	8.2NF	K 400V
CS27	70040400	Cap, Plastic	22NF	K 250V
CS32	70040721	Cap, Electrolytic	22MF	M 16V
CS33	70040737	Cap, Electrolytic	33MF	M 16V
CS37	70040499	Cap, Plastic	10NF	K 50V
CS40	24206229	Cap, Electrolytic	2.2MF	M 50V
CS50	70040723	Cap, Electrolytic	1MF	M 50V
CT06	70040033	Cap, Ceramic	10NF	N 25V
CT08	--------	Not Used		
CT10	70040012	Cap, Ceramic	6.8NF	M 25V
CT11	70040722	Cap, Electrolytic	47MF	M 16V
CT13	70040630	Cap, Plastic	220NF	M 63V
CT14	--------	Not Used		
CT15	--------	Not Used		
CT16	--------	Not Used		
CT17	70040410	Cap, Electrolytic	1MF	M 63V
CT18	24794220	Cap, Electrolytic	22MF	16V
CT21	70040415	Cap, Electrolytic	47MF	M 16V
CT22	70040013	Cap, Ceramic	22PF	J 50V
CT24	70040013	Cap, Ceramic	22PF	J 50V
CT26	70040415	Cap, Electrolytic	47MF	M 16V
CT32	70040032	Cap, Ceramic	1NF	M 50V
CT46	--------	Not Used		
CT47	--------	Not Used		
CT50	--------	Not Used		
CT51	--------	Not Used		
CT52	--------	Not Used		
CT56	70040628	Cap, Plastic	150NF	J 63V
CT57	70040505	Cap, Plastic	47NF	M 63V
CT58	24794220	Cap, Electrolytic	22MF	16V

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
CT64	24794220	Cap, Electrolytic	22MF	16V
CT66	--------	Not Used		
CT67	24633100	Cap, Electrolytic	10MF	M 16V
CT71	70040053	Cap, Plastic	56NF	J 63V
CT72	24633100	Cap, Electrolytic	10MF	M 16V
CT80	70040032	Cap, Ceramic	1NF	M 50V
CT81	70040032	Cap, Ceramic	1NF	M 50V
CT82	70040032	Cap, Ceramic	1NF	M 50V
CT83	70040025	Cap, Ceramic	220PF	K 50V
CT84	70040032	Cap, Ceramic	1NF	M 50V
CT85	70040035	Cap, Ceramic	22NF	N 16V
CT86	24633100	Cap, Electrolytic	10MF	M 16V
CT87	70040033	Cap, Ceramic	10NF	N 25V
CW03	70040530	Cap, Electrolytic	100MF	M 16V
CW06	70040292	Cap, Ceramic	22PF	C 50V
CW07	24353150	Cap, Ceramic	15PF	J 50V
CW08	70040475	Cap, Ceramic	120PF	J 50V
CW09	70040025	Cap, Ceramic	220PF	K 50V
CW11	70040010	Cap, Ceramic	100PF	J 50V
CW27	24205479	Cap, Electrolytic	4. 7MF	M 35V
CW29	24203100	Cap, Electrolytic	10MF	M 16V
CW32	70040289	Cap, Plastic	33NF	M 63V
CW33	70040024	Cap, Ceramic	150PF	K 50V
CW37	70040722	Cap, Electrolytic	47MF	M 16V
CW38	70040287	Cap, Plastic	100NF	M 50V
CW39	70040033	Cap, Ceramic	10NF	N 25V
		- RESISTORS -		
RE37	70040138	Res, Carbon	470	J 1/6W
RE38	70040546	Res, Carbon	560	J 1/4W
RE52	70040140	Res, Carbon	1.8K	J 1/6W
RF08	70040153	Res, Carbon	3.3K	J 1/6W
RF09	70040754	Res, Carbon	200	J 1/6W
RF20	70040117	Res, Carbon	4.7K	J 1/4W
RF41	70040780	Res, Carbon	470	J 1/4W
RF43	70040173	Res, Carbon	680	J 1/6W
RF44	70040881	Res, Carbon	39	J
RF46	70040111	Res, Carbon	1.8	J 1/4W
RF47	70040184	Res, Carbon	5.6K	J 1/6W
RF48	70040148	Res, Carbon	68K	J 1/6W
RF49	70040141	Res, Carbon	1.2K	J 1/6W
RF51	70040142	Res, Carbon	820	J 1/6W
RF52	70040175	Res, Carbon	100K	J 1/6W
RF54	70040140	Res, Carbon	1.8K	J 1/6W
RF56	70040161	Res, Carbon	2.7K	J 1/6W
RN02	70040105	Res, Carbon	10K	J 1/4W
RN11	70040150	Res, Carbon	1K	J 1/6W
RN17	70040673	Res, Carbon	270K	J 1/4W
RN20	70040747	Res, Carbon	820	J 1/4W
RN27	70040143	Res, Carbon	390	J 1/6W
RN35	--------	Not Used		
RN42	70040744	Res, Carbon	1.2K	J 1/4W
RN45	70040201	Res, Carbon	1.3K	J 1/6W
RN46	70040743	Res, Carbon	3.3K	J 1/4W
RN48	70040745	Res, Carbon	22K	J 1/4W
RN49	70040139	Res, Carbon	4.7K	J 1/6W
RN52	70040749	Res, Carbon	56K	J 0.14W
RN53	--------	Not Used		
RN54	70040165	Res, Carbon	27K	J 1/6W
RN56	70040761	Res, Metal	806	F 1/6W
RN60	70040147	Res, Carbon	22K	J 1/6W
RN61	70040150	Res, Carbon	1K	J 1/6W
RN63	70040147	Res, Carbon	22K	J 1/6W
RN75	70040138	Res, Carbon	470	J 1/6W
RN80	70040150	Res, Carbon	1K	J 1/6W
RN83	70040151	Res, Carbon	560	J 1/6W
RN84	70040173	Res, Carbon	680	J 1/6W
RN85	70040145	Res, Carbon	10K	J 1/6W
RN86	70040139	Res, Carbon	4.7K	J 1/6W
RN89	70040755	Res, Carbon	2.4K	J 1/6W
RN95	70040150	Res, Carbon	1K	J 1/6W
RS31	70040879	Res, Fusible	6.8	J
RS33	70040160	Res, Carbon	220	J 1/6W
RS36	70040145	Res, Carbon	10K	J 1/6W
RS41	70040746	Res, Carbon	150	J 1/4W
RT02	70040139	Res, Carbon	4.7K	J 1/6W

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
RT03	70040145	Res, Carbon	10K	J 1/6W
RT04	70040145	Res, Carbon	10K	J 1/6W
RT05	70040171	Res, Carbon	100	J 1/6W
RT06	70040147	Res, Carbon	22K	J 1/6W
RT08	70040146	Res, Carbon	47K	J 1/6W
RT09	70040147	Res, Carbon	22K	J 1/6W
RT10	--------	Not Used		
RT11	70040145	Res, Carbon	10K	J 1/6W
RT12	70040148	Res, Carbon	68K	J 1/6W
RT13	70040745	Res, Carbon	22K	J 1/4W
RT14	70040174	Res, Carbon	2.2K	J 1/6W
RT17	70040178	Res, Carbon	470K	J 1/6W
RT18	70040147	Res, Carbon	22K	J 1/6W
RT19	70040146	Res, Carbon	47K	J 1/6W
RT20	70040150	Res, Carbon	1K	J 1/6W
RT21	70040171	Res, Carbon	100	J 1/6W
RT22	70040149	Res, Carbon	33K	J 1/6W
RT23	70040178	Res, Carbon	470K	J 1/6W
RT24	70040178	Res, Carbon	470K	J 1/6W
RT25	70040138	Res, Carbon	470	J 1/6W
RT26	70040149	Res, Carbon	33K	J 1/6W
RT27	70040171	Res, Carbon	100	J 1/6W
RT28	--------	Not Used		
RT29	--------	Not Used		
RT32	70040139	Res, Carbon	4.7K	J 1/6W
RT33	70040139	Res, Carbon	4.7K	J 1/6W
RT34	70040748	Res, Carbon	10M	K 1/4W
RT35	--------	Not Used		
RT36	70040177	Res, Carbon	220K	J 1/6W
RT37	70040144	Res, Carbon	270	J 1/6W
RT38	70040157	Res, Carbon	6.8K	J 1/6W
RT39	70040174	Res, Carbon	2.2K	J 1/6W
RT40	--------	Not Used		
RT42	70040145	Res, Carbon	10K	J 1/6W
RT43	70040139	Res, Carbon	4.7K	J 1/6W
RT44	70040150	Res, Carbon	1K	J 1/6W
RT45	70040175	Res, Carbon	100K	J 1/6W
RT46	70040145	Res, Carbon	10K	J 1/6W
RT47	70040139	Res, Carbon	4.7K	J 1/6W
RT48	70040145	Res, Carbon	10K	J 1/6W
RT49	70040165	Res, Carbon	27K	J 1/6W
RT50	70040155	Res, Carbon	15K	J 1/6W
RT51	--------	Not Used		
RT52	70040164	Res, Carbon	18K	J 1/6W
RT53	70040165	Res, Carbon	27K	J 1/6W
RT55	70040153	Res, Carbon	3.3K	J 1/6W
RT56	--------	Not Used		
RT57	70040155	Res, Carbon	15K	J 1/6W
RT58	70040174	Res, Carbon	2.2K	J 1/6W
RT59	--------	Not Used		
RT61	--------	Not Used		
RT62	--------	Not Used		
RT64	--------	Not Used		
RT65	70040141	Res, Carbon	1.2K	J 1/6W
RT66	70040185	Res, Carbon	120	J 1/6W
RT67	70040173	Res, Carbon	680	J 1/6W
RT68	70040172	Res, Carbon	330	J 1/6W
RT69	70040139	Res, Carbon	4.7K	J 1/6W
RT70	70040601	Res, Metal	221	F 1/6W
RT71	70040147	Res, Carbon	22K	J 1/6W
RT72	70040147	Res, Carbon	22K	J 1/6W
RT73	70040145	Res, Carbon	10K	J 1/6W
RT75	70040760	Res, Metal	28	F 1/6W
RT76	70040147	Res, Carbon	22K	J 1/6W
RT77	70040184	Res, Carbon	5.6K	J 1/6W
RT78	70040105	Res, Carbon	10K	J 1/4W
RT79	70040150	Res, Carbon	1K	J 1/6W
RT80	70040147	Res, Carbon	22K	J 1/6W
RT82	70040145	Res, Carbon	10K	J 1/6W
RT84	--------	Not Used		
RT85	--------	Not Used		
RT86	70040147	Res, Carbon	22K	J 1/6W
RT87	70040105	Res, Carbon	10K	J 1/4W
RT88	70040184	Res, Carbon	5.6K	J 1/6W
RT89	70040139	Res, Carbon	4.7K	J 1/6W

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
RT90	70040139	Res,Carbon	4.7K	J 1/6W
RT91	70040139	Res,Carbon	4.7K	J 1/6W
RT92	--------	Not Used		
RT93	--------	Not Used		
RT95	70040145	Res,Carbon	10K	J 1/6W
RT96	70040139	Res,Carbon	4.7K	J 1/6W
RT99	70040139	Res,Carbon	4.7K	J 1/6W
RW04	70040547	Res,Carbon	1K	J 1/4W
RW05	70040146	Res,Carbon	47K	J 1/6W
RW07	70040146	Res,Carbon	47K	J 1/6W
RW08	70040146	Res,Carbon	47K	J 1/6W
RW10	70040753	Res,Carbon	1.2K	G 1/6W
RW11	70040759	Res,Metal	4.75	F 1/6W
RW12	70040173	Res,Carbon	680	J 1/6W
RW25	70040150	Res,Carbon	1K	J 1/6W
RW27	70040105	Res,Carbon	10K	J 1/4W
RW29	70040175	Res,Carbon	100K	J 1/6W
RW33	70040179	Res,Carbon	1M	J 1/6W
RW34	70040174	Res,Carbon	2.2K	J 1/6W
RW36	70040386	Res,Carbon	820K	J 1/6W
RW37	70040175	Res,Carbon	100K	J 1/6W
RW39	70040186	Res,Carbon	5.1K	J 1/6W
RW41	70040386	Res,Carbon	820K	J 1/6W
RW42	70040175	Res,Carbon	100K	J 1/6W
RW49	70040451	Res,Carbon	12K	
RW53	70040139	Res,Carbon	4.7K	J 1/6W
RW60	70040126	Res,Fusible	3.9	
RX01	70040175	Res,Carbon	100K	J 1/6W
RX02	--------	Not Used		
RX03	70040170	Res,Carbon	68	J 1/6W
RY01	70040145	Res,Carbon	10K	J 1/6W
		- MISCELLANEOUS -		
5000	70010365	Tuner,MTP-BG-2003		
5005	70010641	F.U.	IF	
FE14	70010645	Coil,Variable	4.28MHz	
FW11	70010274	Filter		
QT34	70010656	Crystal	8MHz	
■0565	70090096	P C Board Assy	Key Display	
■0183	70090090	P C Board Assy	CHV	
		- INTEGRATED CIRCUITS -		
IC01	70010168	IC	LA7330	
IC05	70010660	IC	BA7604N	
IC16	70010661	IC	LF355	
		- TRANSISTORS -		
TC01	70010137	Transistor	BC558B	
TC02	70010137	Transistor	BC558B	
TC05	70010134	Transistor	BC548B	
TC10	70010137	Transistor	BC558B	
TC20	70010134	Transistor	BC548B	
TC21	70010134	Transistor	BC548B	
TC22	70010134	Transistor	BC548B	
TC35	70010134	Transistor	BC548B	
TC40	70010134	Transistor	BC548B	
		- DIODES -		
DC11	70010152	Diode	1N4148	
		- COILS -		
LC02	70010125	Filter		
LC20	70010562	Coil,Peaking		
LC21	70010643	Coil,Peaking		
LC22	70010643	Coil,Peaking		
LC23	23237985	Coil,Peaking	TRF4150AC	
LC26	23237981	Coil,Peaking	TRF4330AC	
LC31	23237999	Coil,Peaking	TRF4109AC	
LC33	70010562	Coil,Peaking		
		- CAPACITORS -		
CC01	70040035	Cap,Ceramic	22NF	N 16V
CC03	70040035	Cap,Ceramic	22NF	N 16V
CC04	70040734	Cap,Plastic	22NF	M 63V
CC05	70040049	Cap,Plastic	220NF	K 63V
CC06	70040044	Cap,Plastic	33NF	K 63V
CC07	70040035	Cap,Ceramic	22NF	N 16V
CC08	70040723	Cap,Electrolytic	1MF	M 50V
CC09	70040035	Cap,Ceramic	22NF	N 16V
CC10	24206229	Cap,Electrolytic	2.2MF	M 50V
CC11	70040723	Cap,Electrolytic	1MF	M 50V
CC12	70040723	Cap,Electrolytic	1MF	M 50V
CC13	70040723	Cap,Electrolytic	1MF	M 50V
CC14	70040035	Cap,Ceramic	22NF	N 16V
CC15	70040035	Cap,Ceramic	22NF	N 16V
CC16	70040035	Cap,Ceramic	22NF	N 16V
CC17	70040045	Cap,Plastic	47NF	K 63V
CC18	24205479	Cap,Electrolytic	4.7MF	M 35V
CC21	70040474	Cap,Ceramic	68PF	J 50V
CC22	70040035	Cap,Ceramic	22NF	N 16V
CC23	70040047	Cap,Plastic	100NF	K 63V
CC24	70040723	Cap,Electrolytic	1MF	M 50V
CC25	70040721	Cap,Electrolytic	22MF	M 16V
CC26	70040222	Cap,Ceramic	680PF	K 50V
CC28	70040010	Cap,Ceramic	100PF	J 50V
CC29	70040035	Cap,Ceramic	22NF	N 16V
CC30	70040740	Cap,Electrolytic	470MF	M 16V
CC31	70040015	Cap,Ceramic	39PF	J 50V
CC32	70040538	Cap,Ceramic	270PF	J 50V
CC33	70040015	Cap,Ceramic	39PF	J 50V
CC34	70040045	Cap,Plastic	47NF	K 63V
CC35	70040723	Cap,Electrolytic	1MF	M 50V
CC36	70040035	Cap,Ceramic	22NF	N 16V
CC37	24205479	Cap,Electrolytic	4.7MF	M 35V
CC38	70040723	Cap,Electrolytic	1MF	M 50V
CC41	70040723	Cap,Electrolytic	1MF	M 50V
		- RESISTORS -		
RC01	70040171	Res,Carbon	100	J 1/6W
RC02	70040199	Res,Carbon	430	J 1/6W
RC03	70040545	Res,Carbon	680	J 1/4W
RC04	70040138	Res,Carbon	470	J 1/6W
RC05	70040203	Res,Carbon	1.1K	J 1/6W
RC06	70040157	Res,Carbon	6.8K	J 1/6W
RC07	70040138	Res,Carbon	470	J 1/6W
RC08	70040174	Res,Carbon	2.2K	J 1/6W
RC09	70040140	Res,Carbon	1.8K	J 1/6W
RC10	70040143	Res,Carbon	390	J 1/6W
RC11	70040150	Res,Carbon	1K	J 1/6W
RC12	70040147	Res,Carbon	22K	J 1/6W
RC13	70040141	Res,Carbon	1.2K	J 1/6W
RC14	70040150	Res,Carbon	1K	J 1/6W
RC15	70040141	Res,Carbon	1.2K	J 1/6W
RC16	70040756	Res,Carbon	120K	G 1/6W
RC17	70040147	Res,Carbon	22K	J 1/6W
RC18	70040162	Res,Carbon	8.2K	J 1/6W
RC19	70040142	Res,Carbon	820	J 1/6W
RC20	70040156	Res,Carbon	39K	J 1/6W
RC21	70040172	Res,Carbon	330	J 1/6W
RC22	70040155	Res,Carbon	15K	J 1/6W
RC23	70040201	Res,Carbon	1.3K	J 1/6W
RC24	70040385	Res,Carbon	150	J 1/10W
RC25	70040172	Res,Carbon	330	J 1/6W
RC26	70040150	Res,Carbon	1K	J 1/6W
RC27	70040150	Res,Carbon	1K	J 1/6W
RC28	70040150	Res,Carbon	1K	J 1/6W
RC29	70040177	Res,Carbon	220K	J 1/6W
RC30	70040200	Res,Carbon	910	J 1/6W
RC32	70040757	Res,Carbon	130K	G 1/6W
RC33	70040150	Res,Carbon	1K	J 1/6W
RC34	70040118	Res,Carbon	4.7K	J 1/4W
RC35	70040150	Res,Carbon	1K	J 1/6W
RC37	70040141	Res,Carbon	1.2K	J 1/6W
RC38	70040150	Res,Carbon	1K	J 1/6W
RC42	70040142	Res,Carbon	820	J 1/6W
RC46	70040145	Res,Carbon	10K	J 1/6W
RC47	70040164	Res,Carbon	18K	J 1/6W
RC48	70040746	Res,Carbon	150	J 1/4W
PC01	70040217	Res,Variable	4K	
		- MISCELLANEOUS -		
FC01	70010122	Filter		
FC02	70010444	Filter		
FC03	70010126	Filter		
FC15	70010127	LPF		
FC25	70010128	Filter		

LOCATION NUMBER	PART NUMBER	DESCRIPTION	
QC30	70010118	Crystal, 4. 43MHz	
V180F			
■0240	70090097	P C Board Assy	Main
		- INTEGRATED CIRCUITS -	
IT01	70010663	IC	ZC407454CP
IT10	70010166	IC	U2561B
IT18	--------	Not Used	
IT46	--------	Not Used	
IT50	70010170	IC	U2559B
IT80	70010662	IC	MC14020BCP
		- TRANSISTORS -	
TF26	70010573	Transistor	BC548
TF44	70010144	Transistor	BC548C
TF48	70010137	Transistor	BC558B
TF53	70010134	Transistor	BC548B
TN49	70010134	Transistor	BC548B
TN57	--------	Not Used	
TN58	--------	Not Used	
TN60	70010137	Transistor	BC558B
TN63	70010137	Transistor	BC558B
TN75	70010137	Transistor	BC558B
TN80	70010134	Transistor	BC548B
TN85	70010134	Transistor	BC548B
TT01	70010573	Transistor	BC548
TT02	70010573	Transistor	BC548
TT03	--------	Not Used	
TT06	70010573	Transistor	BC548
TT10	--------	Not Used	
TT19	--------	Not Used	
TT20	70010573	Transistor	BC548
TT24	--------	Not Used	
TT26	--------	Not Used	
TT33	--------	Not Used	
TT36	70010573	Transistor	BC548
TT37	70010446	Transistor	BC558
TT43	70010446	Transistor	BC558
TT44	70010446	Transistor	BC558
TT46	70010573	Transistor	BC548
TT60	70010137	Transistor	BC558B
TT66	--------	Not Used	
TT68	--------	Not Used	
TT70	70010573	Transistor	BC548
TT75	--------	Not Used	
TT76	--------	Not Used	
TT77	70010446	Transistor	BC558
TT78	70010573	Transistor	BC548
TT80	--------	Not Used	
TT83	70010573	Transistor	BC548
TW04	70010134	Transistor	BC548B
TW49	70010573	Transistor	BC548
TW56	70010573	Transistor	BC548
TX01	70010574	Transistor	BC547
		- DIODES -	
DF48	70010152	Diode	1N4148
DT06	70010155	Diode, Zener	ZPD8. 2
DT07	70010524	Diode	ZPD11
DT14	--------	Not Used	
DT15	--------	Not Used	
DT21	70010152	Diode	1N4148
DT22	70010152	Diode	1N4148
DT24	70010152	Diode	1N4148
DT27	70010152	Diode	1N4148
DT31	--------	Not Used	
DT38	--------	Not Used	
DT46	--------	Not Used	
DT51	70010152	Diode	1N4148
DT53	--------	Not Used	
DT64	--------	Not Used	
DT66	--------	Not Used	
DT70	70010525	Diode	ZPD5. 1
DT71	--------	Not Used	
DT72	70010152	Diode	1N4148
DT73	--------	Not Used	
		- COILS -	

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
LF01	70010485	Coil, Peaking		
LF03	70010488	Coil, Peaking		
LF08	23238912	Coil, Peaking	TRF4680AC	
LF45	23238916	Coil, Peaking	TRF4330AC	
LF46	70010490	Coil, Peaking		
LN40	23237983	Coil, Peaking	TRF4220AC	
LN89	70010485	Coil, Peaking		
LT01	70010756	Coil, Choke		
LW06	23238915	Coil, Peaking	TRF4390AC	
LW08	70010642	Coil, Peaking		
LW37	23238916	Coil, Peaking	TRF4330AC	
		- CAPACITORS -		
CE14	24203100	Cap, Electrolytic	10MF	M 16V
CE17	24203100	Cap, Electrolytic	10MF	M 16V
CE37	70040474	Cap, Ceramic	68PF	J 50V
CE41	24203100	Cap, Electrolytic	10MF	M 16V
CE54	70040741	Cap, Ceramic	270PF	K 50V
CE56	70040741	Cap, Ceramic	270PF	K 50V
CE57	24203100	Cap, Electrolytic	10MF	M 16V
CF33	24203100	Cap, Electrolytic	10MF	M 16V
CF44	70040035	Cap, Ceramic	22NF	N 16V
CF45	70040088	Cap, Electrolytic	22MF	M 16V
CF46	70040035	Cap, Ceramic	22NF	N 16V
CF47	70040027	Cap, Ceramic	1. 5NF	K 50V
CF49	70040035	Cap, Ceramic	22NF	N 16V
CF53	70040877	Cap, Plastic	33NF	M 63V
CN03	--------	Not Used		
CN11	24205479	Cap, Electrolytic	4. 7MF	M 35V
CN12	70040220	Cap, Ceramic	82PF	J 50V
CN24	24203100	Cap, Electrolytic	10MF	M 16V
CN27	70040009	Cap, Ceramic	56PF	J 50V
CN37	70040878	Cap, Electrolytic	220MF	M 16V
CN39	70040537	Cap, Ceramic	100PF	J 50V
CN56	70040530	Cap, Electrolytic	100MF	M 16V
CN62	70040721	Cap, Electrolytic	22MF	M 16V
CN64	24203100	Cap, Electrolytic	10MF	M 16V
CN85	70040035	Cap, Ceramic	22NF	N 16V
CN86	70040033	Cap, Ceramic	10NF	N 25V
CS01	70040509	Cap, Electrolytic	470MF	M 16V
CS03	70040722	Cap, Electrolytic	47MF	M 16V
CS07	70040736	Cap, Plastic	8. 2NF	K 400V
CS27	70040400	Cap, Plastic	22NF	K 250V
CS32	70040721	Cap, Electrolytic	22MF	M 16V
CS33	70040737	Cap, Electrolytic	33MF	M 16V
CS37	70040499	Cap, Plastic	10NF	K 50V
CS40	24206229	Cap, Electrolytic	2. 2MF	M 50V
CS50	70040723	Cap, Electrolytic	1MF	M 50V
CT06	70040033	Cap, Ceramic	10NF	N 25V
CT08	--------	Not Used		
CT10	70040012	Cap, Ceramic	6. 8NF	M 25V
CT11	70040722	Cap, Electrolytic	47MF	M 16V
CT13	70040630	Cap, Plastic	220NF	M 63V
CT14	--------	Not Used		
CT15	--------	Not Used		
CT16	--------	Not Used		
CT17	70040410	Cap, Electrolytic	1MF	M 63V
CT18	24794220	Cap, Electrolytic	22MF	16V
CT21	70040415	Cap, Electrolytic	47MF	M 16V
CT22	70040013	Cap, Ceramic	22PF	J 50V
CT24	70040013	Cap, Ceramic	22PF	J 50V
CT26	70040415	Cap, Electrolytic	47MF	M 16V
CT32	70040032	Cap, Ceramic	1NF	M 50V
CT46	--------	Not Used		
CT47	--------	Not Used		
CT50	--------	Not Used		
CT51	--------	Not Used		
CT52	--------	Not Used		
CT56	70040628	Cap, Plastic	150NF	J 63V
CT57	70040505	Cap, Plastic	47NF	M 63V
CT58	24794220	Cap, Electrolytic	22MF	16V
CT64	24794220	Cap, Electrolytic	22MF	16V
CT66	--------	Not Used		
CT67	24633100	Cap, Electrolytic	10MF	M 16V
CT71	70040053	Cap, Plastic	56NF	J 63V
CT72	24633100	Cap, Electrolytic	10MF	M 16V

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
CT80	70040032	Cap, Ceramic	1NF	M 50V
CT81	70040032	Cap, Ceramic	1NF	M 50V
CT82	70040032	Cap, Ceramic	1NF	M 50V
CT83	70040025	Cap, Ceramic	220PF	K 50V
CT84	70040032	Cap, Ceramic	1NF	M 50V
CT85	70040035	Cap, Ceramic	22NF	N 16V
CT86	24633100	Cap, Electrolytic	10MF	M 16V
CT87	70040033	Cap, Ceramic	10NF	N 25V
CW03	70040530	Cap, Electrolytic	100MF	M 16V
CW06	70040292	Cap, Ceramic	22PF	C 50V
CW07	24353150	Cap, Ceramic	15PF	J 50V
CW08	70040475	Cap, Ceramic	120PF	J 50V
CW09	70040025	Cap, Ceramic	220PF	K 50V
CW11	70040010	Cap, Ceramic	100PF	J 50V
CW27	24205479	Cap, Electrolytic	4. 7MF	M 35V
CW29	24203100	Cap, Electrolytic	10MF	M 16V
CW32	70040289	Cap, Plastic	33NF	M 63V
CW33	70040024	Cap, Ceramic	150PF	K 50V
CW37	70040722	Cap, Electrolytic	47MF	M 16V
CW38	70040287	Cap, Plastic	100NF	M 50V
CW39	70040033	Cap, Ceramic	10NF	N 25V
		- RESISTORS -		
RE37	70040138	Res, Carbon	470	J 1/6W
RE38	70040546	Res, Carbon	560	J 1/4W
RE52	70040140	Res, Carbon	1. 8K	J 1/6W
RF08	70040153	Res, Carbon	3. 3K	J 1/6W
RF09	70040754	Res, Carbon	200	J 1/6W
RF20	70040117	Res, Carbon	4. 7K	J 1/4W
RF41	70040780	Res, Carbon	470	J 1/4W
RF43	70040173	Res, Carbon	680	J 1/6W
RF44	70040881	Res, Carbon	39	J
RF46	70040111	Res, Carbon	1. 8	J 1/4W
RF47	70040184	Res, Carbon	5. 6K	J 1/6W
RF48	70040148	Res, Carbon	68K	J 1/6W
RF49	70040141	Res, Carbon	1. 2K	J 1/6W
RF51	70040142	Res, Carbon	820	J 1/6W
RF52	70040175	Res, Carbon	100K	J 1/6W
RF54	70040140	Res, Carbon	1. 8K	J 1/6W
RF56	70040161	Res, Carbon	2. 7K	J 1/6W
RN02	70040105	Res, Carbon	10K	J 1/4W
RN11	70040150	Res, Carbon	1K	J 1/6W
RN17	70040673	Res, Carbon	270K	J 1/4W
RN20	70040747	Res, Carbon	820	J 1/4W
RN27	70040143	Res, Carbon	390	J 1/6W
RN35	--------	Not Used		
RN42	70040744	Res, Carbon	1. 2K	J 1/4W
RN45	70040201	Res, Carbon	1. 3K	J 1/6W
RN46	70040743	Res, Carbon	3. 3K	J 1/4W
RN48	70040745	Res, Carbon	22K	J 1/4W
RN49	70040139	Res, Carbon	4. 7K	J 1/6W
RN52	70040749	Res, Carbon	56K	J 0. 14W
RN53	--------	Not Used		
RN54	70040165	Res, Carbon	27K	J 1/6W
RN56	70040761	Res, Metal	806	F 1/6W
RN60	70040147	Res, Carbon	22K	J 1/6W
RN61	70040150	Res, Carbon	1K	J 1/6W
RN63	70040147	Res, Carbon	22K	J 1/6W
RN75	70040138	Res, Carbon	470	J 1/6W
RN80	70040150	Res, Carbon	1K	J 1/6W
RN83	70040151	Res, Carbon	560	J 1/6W
RN84	70040173	Res, Carbon	680	J 1/6W
RN85	70040145	Res, Carbon	10K	J 1/6W
RN86	70040139	Res, Carbon	4. 7K	J 1/6W
RN89	70040755	Res, Carbon	2. 4K	J 1/6W
RN95	70040150	Res, Carbon	1K	J 1/6W
RS31	70040879	Res, Fusible	6. 8	J
RS33	70040160	Res, Carbon	220	J 1/6W
RS36	70040145	Res, Carbon	10K	J 1/6W
RS41	70040746	Res, Carbon	150	J 1/4W
RT02	70040139	Res, Carbon	4. 7K	J 1/6W
RT03	70040145	Res, Carbon	10K	J 1/6W
RT04	70040145	Res, Carbon	10K	J 1/6W
RT05	70040171	Res, Carbon	100	J 1/6W
RT06	70040147	Res, Carbon	22K	J 1/6W
RT08	70040146	Res, Carbon	47K	J 1/6W

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
RT09	70040147	Res, Carbon	22K	J 1/6W
RT10	--------	Not Used		
RT11	70040145	Res, Carbon	10K	J 1/6W
RT12	70040148	Res, Carbon	68K	J 1/6W
RT13	70040745	Res, Carbon	22K	J 1/4W
RT14	70040174	Res, Carbon	2. 2K	J 1/6W
RT17	70040178	Res, Carbon	470K	J 1/6W
RT18	70040147	Res, Carbon	22K	J 1/6W
RT19	70040146	Res, Carbon	47K	J 1/6W
RT20	70040150	Res, Carbon	1K	J 1/6W
RT21	70040171	Res, Carbon	100	J 1/6W
RT22	70040149	Res, Carbon	33K	J 1/6W
RT23	70040178	Res, Carbon	470K	J 1/6W
RT24	70040178	Res, Carbon	470K	J 1/6W
RT25	70040138	Res, Carbon	470	J 1/6W
RT26	70040149	Res, Carbon	33K	J 1/6W
RT27	70040171	Res, Carbon	100	J 1/6W
RT28	--------	Not Used		
RT29	--------	Not Used		
RT32	70040139	Res, Carbon	4. 7K	J 1/6W
RT33	70040139	Res, Carbon	4. 7K	J 1/6W
RT34	70040748	Res, Carbon	10M	K 1/4W
RT35	--------	Not Used		
RT36	70040177	Res, Carbon	220K	J 1/6W
RT37	70040144	Res, Carbon	270	J 1/6W
RT38	70040157	Res, Carbon	6. 8K	J 1/6W
RT39	70040174	Res, Carbon	2. 2K	J 1/6W
RT40	--------	Not Used		
RT42	70040145	Res, Carbon	10K	J 1/6W
RT43	70040139	Res, Carbon	4. 7K	J 1/6W
RT44	70040150	Res, Carbon	1K	J 1/6W
RT45	70040175	Res, Carbon	100K	J 1/6W
RT46	70040145	Res, Carbon	10K	J 1/6W
RT47	70040139	Res, Carbon	4. 7K	J 1/6W
RT48	70040145	Res, Carbon	10K	J 1/6W
RT49	70040165	Res, Carbon	27K	J 1/6W
RT50	70040155	Res, Carbon	15K	J 1/6W
RT51	--------	Not Used		
RT52	70040164	Res, Carbon	18K	J 1/6W
RT53	70040165	Res, Carbon	27K	J 1/6W
RT55	70040153	Res, Carbon	3. 3K	J 1/6W
RT56	--------	Not Used		
RT57	70040155	Res, Carbon	15K	J 1/6W
RT58	70040174	Res, Carbon	2. 2K	J 1/6W
RT59	--------	Not Used		
RT61	--------	Not Used		
RT62	--------	Not Used		
RT64	--------	Not Used		
RT65	70040141	Res, Carbon	1. 2K	J 1/6W
RT66	70040185	Res, Carbon	120	J 1/6W
RT67	70040173	Res, Carbon	680	J 1/6W
RT68	70040172	Res, Carbon	330	J 1/6W
RT69	70040139	Res, Carbon	4. 7K	J 1/6W
RT70	70040601	Res, Metal	221	F 1/6W
RT71	70040147	Res, Carbon	22K	J 1/6W
RT72	70040147	Res, Carbon	22K	J 1/6W
RT73	70040145	Res, Carbon	10K	J 1/6W
RT75	70040760	Res, Metal	28	F 1/6W
RT76	70040147	Res, Carbon	22K	J 1/6W
RT77	70040184	Res, Carbon	5. 6K	J 1/6W
RT78	70040105	Res, Carbon	10K	J 1/4W
RT79	70040150	Res, Carbon	1K	J 1/6W
RT80	70040147	Res, Carbon	22K	J 1/6W
RT82	70040145	Res, Carbon	10K	J 1/6W
RT84	--------	Not Used		
RT85	--------	Not Used		
RT86	70040147	Res, Carbon	22K	J 1/6W
RT87	70040105	Res, Carbon	10K	J 1/4W
RT88	70040184	Res, Carbon	5. 6K	J 1/6W
RT89	70040139	Res, Carbon	4. 7K	J 1/6W
RT90	70040139	Res, Carbon	4. 7K	J 1/6W
RT91	70040139	Res, Carbon	4. 7K	J 1/6W
RT92	--------	Not Used		
RT93	--------	Not Used		
RT95	70040145	Res, Carbon	10K	J 1/6W

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
RT96	70040139	Res, Carbon	4.7K	J 1/6W
RT99	70040139	Res, Carbon	4.7K	J 1/6W
RW04	70040547	Res, Carbon	1K	J 1/4W
RW05	70040146	Res, Carbon	47K	J 1/6W
RW07	70040146	Res, Carbon	47K	J 1/6W
RW08	70040146	Res, Carbon	47K	J 1/6W
RW10	70040753	Res, Carbon	1.2K	G 1/6W
RW11	70040759	Res, Metal	4.75	F 1/6W
RW12	70040173	Res, Carbon	680	J 1/6W
RW25	70040150	Res, Carbon	1K	J 1/6W
RW27	70040105	Res, Carbon	10K	J 1/4W
RW29	70040175	Res, Carbon	100K	J 1/6W
RW33	70040179	Res, Carbon	1M	J 1/6W
RW34	70040174	Res, Carbon	2.2K	J 1/6W
RW36	70040386	Res, Carbon	820K	J 1/6W
RW37	70040175	Res, Carbon	100K	J 1/6W
RW39	70040186	Res, Carbon	5.1K	J 1/6W
RW41	70040386	Res, Carbon	820K	J 1/6W
RW42	70040175	Res, Carbon	100K	J 1/6W
RW49	70040451	Res, Carbon	12K	
RW53	70040139	Res, Carbon	4.7K	J 1/6W
RW60	70040126	Res, Fusible	3.9	
RX01	70040175	Res, Carbon	100K	J 1/6W
RX02	--------	Not Used		
RX03	70040170	Res, Carbon	68	J 1/6W
RY01	70040145	Res, Carbon	10K	J 1/6W
		- MISCELLANEOUS -		
5000	70010365	Tuner, MTP-BG-2003		
5005	70010641	F.U.	IF	
FE14	70010645	Coil, Variable	4.28MHz	
FW11	70010274	Filter		
QT34	70010656	Crystal	8MHz	
■0565	70090096	P C Board Assy	Key Display	
■0575	70090055	P C Board Assy	Key Board	
■0183	70090090	P C Board Assy	CHV	
		- INTEGRATED CIRCUITS -		
IC01	70010168	IC	LA7330	
IC05	70010660	IC	BA7604N	
IC16	70010661	IC	LF355	
		- TRANSISTORS -		
TC01	70010137	Transistor	BC558B	
TC02	70010137	Transistor	BC558B	
TC05	70010134	Transistor	BC548B	
TC10	70010137	Transistor	BC558B	
TC20	70010134	Transistor	BC548B	
TC21	70010134	Transistor	BC548B	
TC22	70010134	Transistor	BC548B	
TC35	70010134	Transistor	BC548B	
TC40	70010134	Transistor	BC548B	
		- DIODES -		
DC11	70010152	Diode	1N4148	
		- COILS -		
LC02	70010125	Filter		
LC20	70010562	Coil, Peaking		
LC21	70010643	Coil, Peaking		
LC22	70010643	Coil, Peaking		
LC23	23237985	Coil, Peaking	TRF4150AC	
LC26	23237981	Coil, Peaking	TRF4330AC	
LC31	23237999	Coil, Peaking	TRF4109AC	
LC33	70010562	Coil, Peaking		
		- CAPACITORS -		
CC01	70040035	Cap, Ceramic	22NF	N 16V
CC03	70040035	Cap, Ceramic	22NF	N 16V
CC04	70040734	Cap, Plastic	22NF	M 63V
CC05	70040049	Cap, Plastic	220NF	K 63V
CC06	70040044	Cap, Plastic	33NF	K 63V
CC07	70040035	Cap, Ceramic	22NF	N 16V
CC08	70040723	Cap, Electrolytic	1MF	M 50V
CC09	70040035	Cap, Ceramic	22NF	N 16V
CC10	24206229	Cap, Electrolytic	2.2MF	M 50V
CC11	70040723	Cap, Electrolytic	1MF	M 50V
CC12	70040723	Cap, Electrolytic	1MF	M 50V
CC13	70040723	Cap, Electrolytic	1MF	M 50V
CC14	70040035	Cap, Ceramic	22NF	N 16V
CC15	70040035	Cap, Ceramic	22NF	N 16V
CC16	70040035	Cap, Ceramic	22NF	N 16V
CC17	70040045	Cap, Plastic	47NF	K 63V
CC18	24205479	Cap, Electrolytic	4.7MF	M 35V
CC21	70040474	Cap, Ceramic	68PF	J 50V
CC22	70040035	Cap, Ceramic	22NF	N 16V
CC23	70040047	Cap, Plastic	100NF	K 63V
CC24	70040723	Cap, Electrolytic	1MF	M 50V
CC25	70040721	Cap, Electrolytic	22MF	M 16V
CC26	70040222	Cap, Ceramic	680PF	K 50V
CC28	70040010	Cap, Ceramic	100PF	J 50V
CC29	70040035	Cap, Ceramic	22NF	N 16V
CC30	70040740	Cap, Electrolytic	470MF	M 16V
CC31	70040015	Cap, Ceramic	39PF	J 50V
CC32	70040538	Cap, Ceramic	270PF	J 50V
CC33	70040015	Cap, Ceramic	39PF	J 50V
CC34	70040045	Cap, Plastic	47NF	K 63V
CC35	70040723	Cap, Electrolytic	1MF	M 50V
CC36	70040035	Cap, Ceramic	22NF	N 16V
CC37	24205479	Cap, Electrolytic	4.7MF	M 35V
CC38	70040723	Cap, Electrolytic	1MF	M 50V
CC41	70040723	Cap, Electrolytic	1MF	M 50V
		- RESISTORS -		
RC01	70040171	Res, Carbon	100	J 1/6W
RC02	70040199	Res, Carbon	430	J 1/6W
RC03	70040545	Res, Carbon	680	J 1/4W
RC04	70040138	Res, Carbon	470	J 1/6W
RC05	70040203	Res, Carbon	1.1K	J 1/6W
RC06	70040157	Res, Carbon	6.8K	J 1/6W
RC07	70040138	Res, Carbon	470	J 1/6W
RC08	70040174	Res, Carbon	2.2K	J 1/6W
RC09	70040140	Res, Carbon	1.8K	J 1/6W
RC10	70040143	Res, Carbon	390	J 1/6W
RC11	70040150	Res, Carbon	1K	J 1/6W
RC12	70040147	Res, Carbon	22K	J 1/6W
RC13	70040141	Res, Carbon	1.2K	J 1/6W
RC14	70040150	Res, Carbon	1K	J 1/6W
RC15	70040141	Res, Carbon	1.2K	J 1/6W
RC16	70040756	Res, Carbon	120K	G 1/6W
RC17	70040147	Res, Carbon	22K	J 1/6W
RC18	70040162	Res, Carbon	8.2K	J 1/6W
RC19	70040142	Res, Carbon	820	J 1/6W
RC20	70040156	Res, Carbon	39K	J 1/6W
RC21	70040172	Res, Carbon	330	J 1/6W
RC22	70040155	Res, Carbon	15K	J 1/6W
RC23	70040201	Res, Carbon	1.3K	J 1/6W
RC24	70040385	Res, Carbon	150	J 1/10W
RC25	70040172	Res, Carbon	330	J 1/6W
RC26	70040150	Res, Carbon	1K	J 1/6W
RC27	70040150	Res, Carbon	1K	J 1/6W
RC28	70040150	Res, Carbon	1K	J 1/6W
RC29	70040177	Res, Carbon	220K	J 1/6W
RC30	70040200	Res, Carbon	910	J 1/6W
RC32	70040757	Res, Carbon	130K	G 1/6W
RC33	70040150	Res, Carbon	1K	J 1/6W
RC34	70040118	Res, Carbon	4.7K	J 1/4W
RC35	70040150	Res, Carbon	1K	J 1/6W
RC37	70040141	Res, Carbon	1.2K	J 1/6W
RC38	70040150	Res, Carbon	1K	J 1/6W
RC42	70040142	Res, Carbon	820	J 1/6W
RC46	70040145	Res, Carbon	10K	J 1/6W
RC47	70040164	Res, Carbon	18K	J 1/6W
RC48	70040746	Res, Carbon	150	J 1/4W
PC01	70040217	Res, Variable	4K	
		- MISCELLANEOUS -		
FC01	70010122	Filter		
FC02	70010444	Filter		
FC03	70010126	Filter		
FC15	70010127	LPF		
FC25	70010128	Filter		
QC30	70010118	Crystal, 4.43MHz		

TOSHIBA CORPORATION
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